Friktion
Modeled Strings

Operation Manual

Reason Studios

reasonstudios.com

Friktion
Modeled Strings

Introduction

Friktion Modeled Strings is a physical modeling string instrument from Reason Studios. Instead of relying on giga-bytes of samples, Friktion is a synthesizer that actually models real string instruments. With clever control keys you can easily play it in a in a way that simply sounds real. Whether it's a violin or an imaginary space harp is up to you.

Few things can compare to the sound of a real instrument. The vibration of a string, the pressure of a finger and even the wood used for the body all make it come alive. We built Friktion to capture all those nuances and put them in your rack, under your fingertips. It adds that special something to any piece of music, but you don't need years of practice to play it.

With its synthesizer workflow, Friktion can sound like the string instruments you love — or entirely new ones yet to be invented. All the important aspects of sculpting a realistic string sound are within reach, but the controls go beyond what's possible in the real world. With a few clicks you change the instrument shape and size, or make the strings buzzy and metallic — creating a new instrument that still sounds decidedly real and is expressive to play.

Controlling Friktion is remarkably easy. An octave of control keys changes how the instrument is played in real time. Bowing, plucking, vibrato, tremolo, gliding up and down the strings and even harmonic overtones are just a key press away. Add in the mod wheel for articulation and you'll have an expressive string performance all your own.

Panel overview

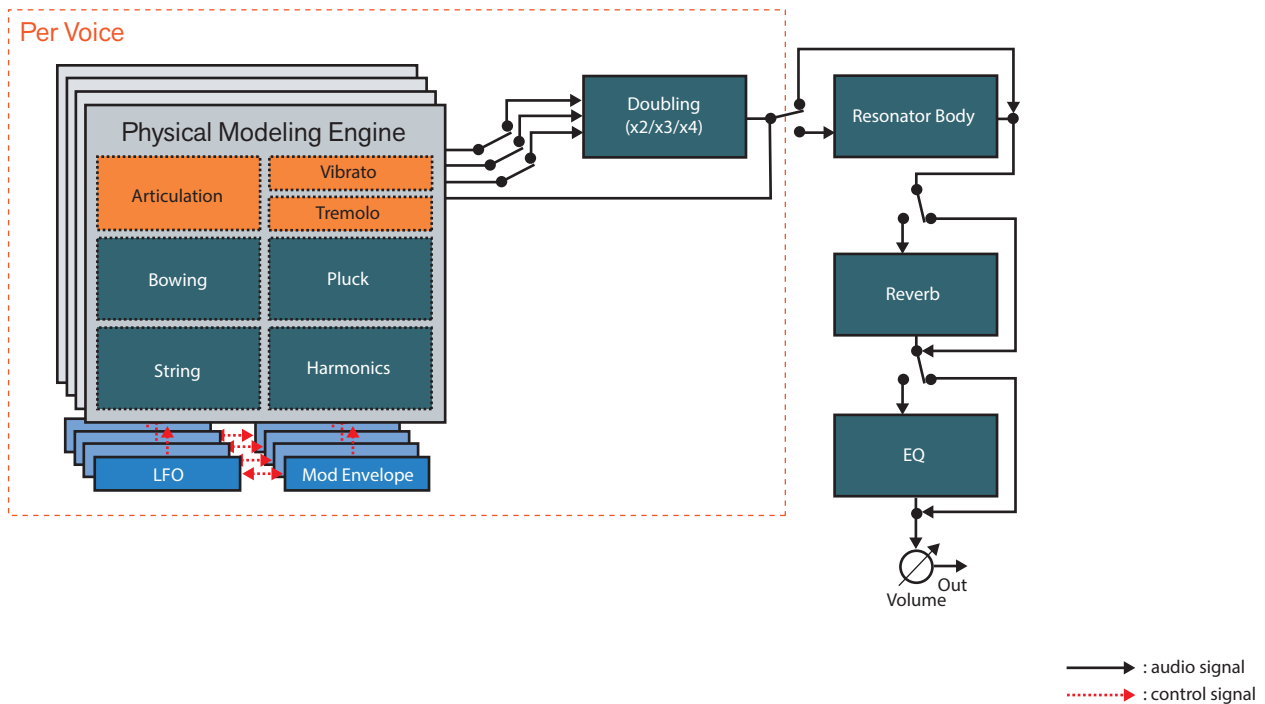The Friktion front panel contains the following sections:

- 1. Patch Selector (for browsing, loading and saving patches) (see **"Loading and saving patches"**)
- 2. Master Volume control
- 3. Vibrato section (see **"Vibrato"**)
- 4. Tremolo section (see **"Tremolo"**)
- 5. Key Mode section (for determining how Friktion should be played) (see **"Key Mode"**)
- 6. Bowing/Pluck section (for determining how the string should be excited) (see **"Bowing"** and **"Pluck"**)
- 7. String section (for determining the string characteristics) (see **"String"**)
- 8. Harmonics section (for selecting overtones of the string) (see **"Harmonics"**)
- 9. Articulation section (for determining how the notes are shaped) (see **"Articulation"**)
- 10. Resonator Body section (for applying specific body resonance characteristics) (see **"Resonator Body"**)
- 11. Reverb and Doubling section (see **"Reverb and Doubling"**)
- 12. LFO section (to be used as Source in the Modulation Matrix) (see **"LFO"**)
- 13. Modulation Envelope section (to be used as Source in the Modulation Matrix) (see **"Mod Envelope"**)

- 14. Modulation Matrix section (see "Modulation Matrix")
- 15. Equalizer section (see "EQ")
- 16. Performance and "play control" section (see "Global performance and "play" controls")

Signal flow

Since Friktion is a physical modeling instrument, the "modules" and signal flow are different compared to a traditional synthesizer. The picture below shows the different "modules" and the basic signal flow:

Per Voice

Physical Modeling Engine

Articulation	Vibrato
	Tremolo
Bowing	Pluck
String	Harmonics

LFO   Mod Envelope

Doubling (x2/x3/x4)

Resonator Body

Reverb

EQ

Volume   Out

⟶ : audio signal
┄┄┄► : control signal

Playing and using Friktion

Loading and saving patches
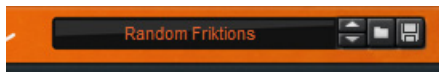
Loading and saving patches is done in the same way as with any other internal Reason device. See the "Sounds and Patches" chapter in the Reason/Reason Rack Plugin/Reason Intro/Reason Lite Operation Manual pdf for details.

As with all Rack Extensions, you can find the included patches by clicking "Rack Extensions" in the Reason browser, navigating to the Friktion Modeled Strings folder and opening it.

Global performance and "play" controls
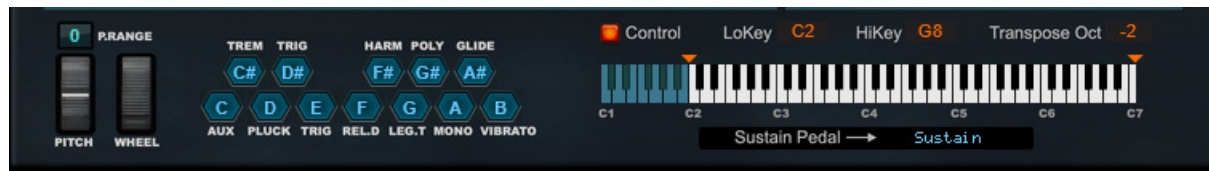
P. Range

→ **Set the desired Pitch Bend range for the "Pitch" wheel by dragging up/down in the display.**
Range: +/-12 semitones (+/-1 octaves) in steps of +/-1 semitone.

Pitch

The Pitch bend wheel can be used for bending note pitches up and down. Friktion also responds to Pitch Bend MIDI data from a connected MIDI master keyboard. You set the desired Pitch bend Range with the "P. Range" control above the Pitch bend wheel.

Wheel

The Mod wheel can be used for controlling almost any parameter in Friktion. Use the Mod wheel as a Source parameter in the Modulation Matrix section and then route to the desired Destination parameter(s), see "Modulation Matrix".

Control Key buttons

These show the functions of the keys in the control octave (C1-B1). If you have a wide enough keyboard, using the control octave keys is a great way to control the sound while you're playing. If not, you can click these buttons for the same results.
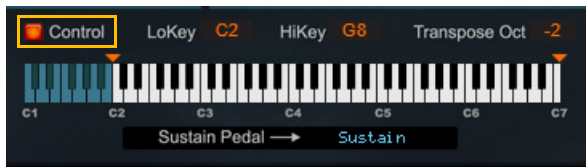
Key	Function
C Aux	No fixed function, but available as a modulation or scaling source in the Mod Matrix.
C# Trem	Toggles Tremolo on or off.

Key	Function
D Pluck	Toggles between Bow and Pluck mode.
D# - E Trig	Pressing one of these while a note is held will retrigger the articulation, allowing manual tremolos and quickly repeated bowed notes. When you are using these keys in the control octave of your keyboard, velocity is taken into account.
F Rel Damp	Toggle Release Damp on or off. This is similar to a string instrument player choosing whether to stop the string after playing a note or let it ring.
F# Harm	Toggle Harmonics on or off.
G Leg. T	Toggle Legato Retrig on or off. Momentarily turning this on is useful if you are playing with the Auto-Mono and Auto-Glide modes and want clearly articulated notes in fast passages.
G# Poly	Toggles Poly mode on. If Friktion is already in Poly mode, this will momentarily switch to Auto Mono mode.
A Mono	Toggles Mono mode on. If Friktion is already in Mono mode, this will momentarily switch to Auto Mono mode.
A# Glide	Toggles Glide on or off.
B Vibrato	Toggles Vibrato on or off. When Vibrato is turned on with this key, it will start directly, skipping the Delay phase. The Vibrato amount is controlled by keyboard Velocity.

! **Note that all Control Keys and buttons are momentary, i.e. when you release a key the function will go back to its previous state.**
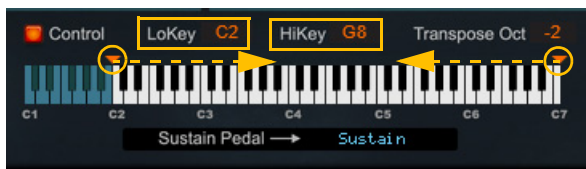
Control Octave On

Normally the C1 octave is used for controlling functions while playing as listed above.

→ **Turn this off if you don't want to use this and want to be sure you don't accidentally play a Control Key during performance.**

LoKey and HiKey

Sets the key range in which Friktion will accept note inputs. This allows you to set up key splits if you are making a combinator with several Friktion devices (for example a string orchestra patch, combining string instruments in different registers). By using this Key Range setting (rather than the key range in the combi programmer), the Control Octave will still be available for the Friktion devices.

→ **Set the key range with the numeric fields or by dragging the range markers above the keyboard image.**

Octave Transpose
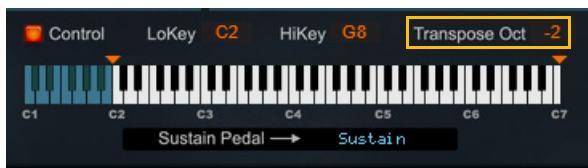
Transposes the sound in octaves (from -2 to 0). Typically, for a violin sound this would be 0 while a cello sound would have it set to -1 and a bass sound to -2.

Friktion has an internal pitch range:

- **The lowest note that can be produced is a F-1 (by playing a C2 key with Octave set to -2 and pitch bend down by 7 semitones).**

- **The highest note is an E6 (by playing an E6 key with Octave set to 0).**

Sustain Pedal
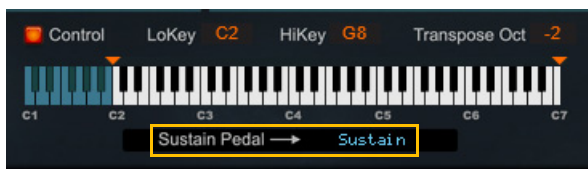
Normally, incoming Sustain Pedal messages (also called Damper Pedal) will keep the sound sustaining, as on most instruments. However, it can be useful to select another function to be controlled by the pedal, to trigger sound changes during performance. This popup menu lets you select one of the functions normally controlled with the Control Keys.

The available functions are: Sustain, Vibrato, Glide, Mono; Poly, Legato Alt, Harmonics, Release Damp, Pluck and Tremolo.

Global output controls
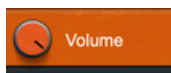
Volume

This is the main stereo output volume control.

Panel reference

Bowing

Bow-Pluck Mode

This switch determines how the string is excited - by bowing or by plucking/striking. The settings in the Bowing section are only active when Bow mode is selected.

→ **Temporarily toggle between Bow and Pluck mode by pressing the Bow-Pluck Key (D1).**

Bow Accent

Accentuates the attack of notes played non-legato.

Bow Pressure

How hard the bow is pressed against the string. This affects the timbre, with higher pressure producing a brighter, richer sound.

Bow Position

Emulates where on the string you're bowing, with the minimum value meaning close to the bridge and the maximum value meaning bowing over the fingerboard. This affects the harmonic content of the sound.

Bow Noise

The amount of noise in the sound.

Articulation to Bow Pressure

When this is turned up, low Articulation will result in low Bow Pressure, so that playing softly produces a darker, more flute-like sound. See "Articulation" for more details.

Bow Variation

Determines how much the Bow Position varies in the beginning of each new note.

Pluck

Bow-Pluck Mode

This switch determines how the string is excited - by bowing or by plucking/striking. The settings in the Pluck section are only active when Pluck mode is selected.

→ **Temporarily toggle between Bow and Pluck mode by pressing the Bow-Pluck Key (D1).**

Pluck Level

A separate level control for Pluck mode. Adjust this so that you can switch between Bow and Pluck mode without unnatural jumps in volume.

Pluck Noise

Raising this value makes the attack of the pluck sound brighter and thinner, as if you plucked the string with a sharper, smaller object.

Pluck Position

Emulates where on the string you're plucking, with lower values meaning closer to the bridge. Higher values will make the sound fuller and more sustaining.

Finger Non-Linearity

Sets the amount of non-linearity due to the finger acting as a fret and making the string vibrate asymmetrically. The result is a thick buzz.

Fingerboard Collisions

Determines the probability of the vibrating string bouncing against the fingerboard, which adds a light buzzing or rattling sound.

Pluck Style

Switches between Pizzicato (plucked with the finger) and Col Legno (struck with the backside of the bow).

Pull Velocity Threshold

Notes with a velocity above this threshold value will sound "pulled" (where the string is lifted and dropped against the fingerboard, also known as Bartok Pizzicato). This produces a more noisy and percussive sound.

Pull Level

The level of the pulled note effect. To turn this effect off, set Level to zero or turn the Velocity Threshold to max.

String

String Decay

How long the undampened string rings out. This has a large effect on notes in Pluck mode but also affects bowed notes after articulation ends (after the "bow is lifted"). Note that the final decay depends on the other parameters in this section too.

Hi Damp Freq

Dampens higher frequencies more quickly. This works much like a filter - turn it up for a brighter sound or vice versa.

Hi Damp Key Follow

Sets how much the Hi Damp Freq will follow the pitch of played notes. If turned up, low notes will be less bright.

Hi Damp Slope

Determines how sharply the high frequencies are cut off by the Hi Damp filter. Raising this will let more top end through.
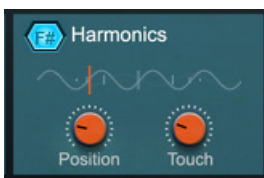
Release Damp On

Turn this on to apply additional damping when the note is released. This is similar to stopping notes with your hand while playing a stringed instrument.

→ **Temporarily toggle this by pressing the Release Damp key (F1).**

Release Damp Amount

Sets how much notes are dampened when Release Damp is on.

Harmonics

To play harmonics on a string instrument, the player touches the string lightly, dampening the fundamental and bringing out an overtone instead. Which overtone is heard depends on where the string is touched.

Harmonics On

Turns on Harmonics.

→ **Temporarily toggle this by pressing the Harmonics Key (F#1).**

Harmonics Position

Emulates where the string is touched, and thus which harmonic is heard. Like on an actual string, only some positions bring out pure harmonic notes - the most important ones are marked in the graphic above.

For example, setting Position to 50% (half the string length) creates the first overtone, one octave up, while setting Position to 33.3% (one third of the string length) brings out the second overtone, one octave and a fifth up.

Other values can result in interesting inharmonic sounds, and you can get great effects by sweeping the Harmonics Position.

Harmonics Touch

Emulates how hard the player presses the string, which affects the tone and pitch stability.
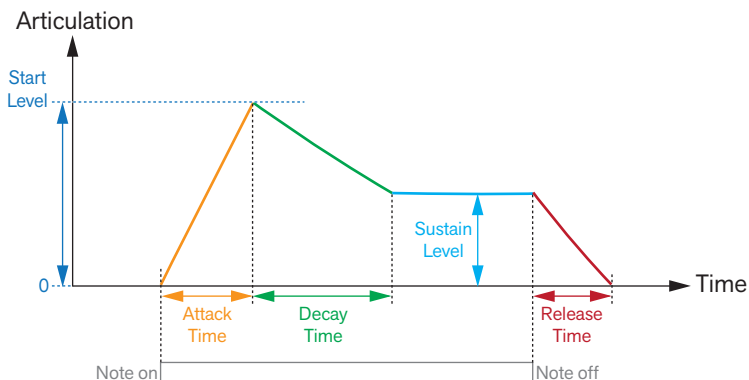
Articulation

The Articulation section determines how the notes are shaped. The settings here describe how the level and timbre of a note changes over time, corresponding to how a violinist would play a note, from the initial attack to lifting the bow. More specifically, the Articulation level corresponds to the speed and pressure of the bow.

! **Note that many of the Articulation settings are closely related to Bowing (see "Bowing") and thus don't apply in Pluck mode (except when Tremolo is on).**

The Articulation curve is similar to the envelope on a synthesizer:

However, this is not how you typically use the Articulation, at least not when Friktion is emulating a bowed instrument such as a violin!
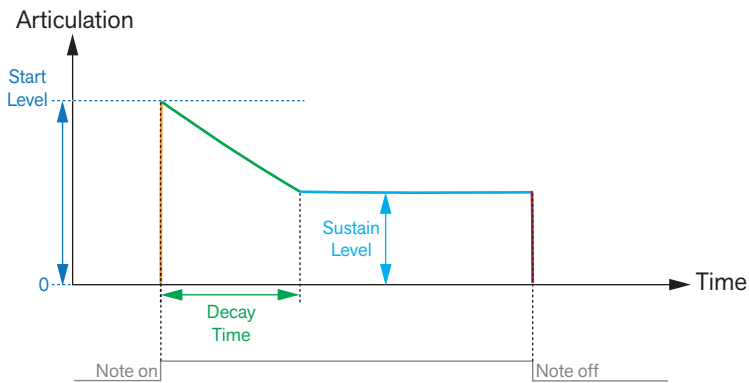
In a typical violin patch:

• **Attack and Release are set to zero or very short times.**

- **Velocity controls the Start Level.**
- **A performance controller such as Mod Wheel controls the Sustain Level, which is often varied continuously during playing.**

This is how the articulation of a note could look:

In this case, the note starts at a high start level. Then it drops to a medium sustain level.

But that's just an example - the articulation curve (the start level, the time for the transition to sustain and the sustain level) depends on your performance and the Articulation parameters:
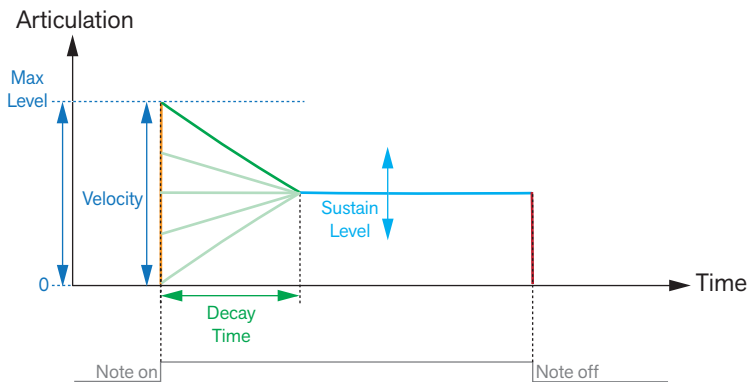
This way you can play notes that start softly and swell (combining low velocity and high sustain level) or staccato notes (combining high velocity and zero sustain level), or variations in between. The key is that you control the articulation in real time when you're playing.

The Articulation section has the following parameters:

Velocity Curve
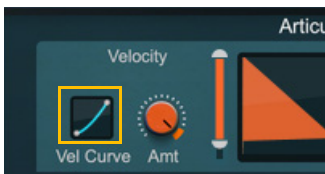
The response curve for velocity. This affects all instances when velocity is used, including Pluck mode and the Mod Matrix. Adjust to your playing style and keyboard.

→ **Drag up/down in the display to change the Velocity Curve characteristics.**
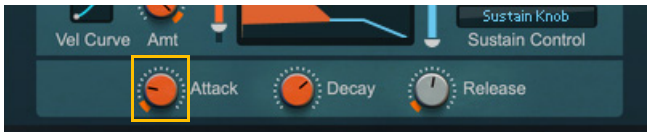
Amt (Velocity to Start Level)

When this parameter is turned up, the start level (after the attack time, if any) is controlled by the velocity of the notes you play. This is the normal mode - turning it down will gradually move the start level to the sustain level. When set to zero, the articulation goes directly to the sustain phase.

## Start Level Range (Min and Max Start Level)

These are set by clicking and dragging the handles up/down. They set the minimum and maximum start level, which allows you to tailor the dynamics of the sound. For example, if you want a softer start, you can lower the Max Start Level. You can also adjust the range offset by dragging the orange line up/down.
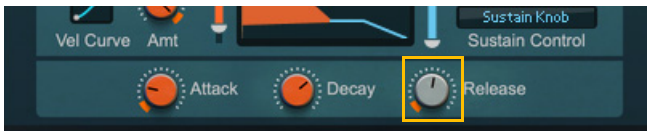
Articulation Attack

The time it takes from note on to the start level. When emulating a bowed instrument this is typically set to zero or a short time, since you control the articulation with velocity and the sustain control. But if you are making e.g. a pad sound that always should fade in softly, you can raise the Attack parameter.

Articulation Decay
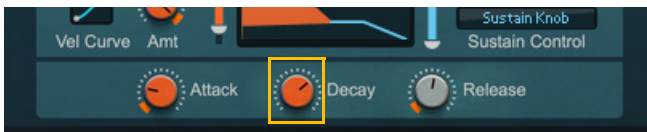
The time it takes for the articulation to move from start level to sustain level. Note that this may not be a decay in the standard sense of the word - if the velocity/start level is low and sustain is high, this will actually become a rise time.

Articulation Release

A fade-out time for bowed articulation after note off.

Normally, releasing a key means lifting the bow. The decaying note depends on the String Decay and Damp settings and is softer and less bright than the bowed tone.

However, if you raise the Articulation Release time, the bow articulation will gradually fade out after the note is released. This means that the note will start decaying with the same timbre as the bowed tone.

This is useful for pads, string synth sounds and similar. When emulating a real bowed instrument, this is typically set to zero.

Sustain Range (Min and Max Sustain Level)
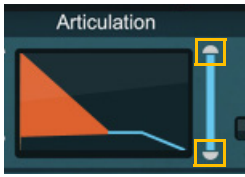
These are set by clicking and dragging the handles to the right of the display. Adjusting the sustain level range can be useful for example if you are controlling sustain with breath control or pressure and don't want the articulation to drop too low - then you raise the minimum sustain level a bit. You can also adjust the range offset by dragging the blue line up/down.

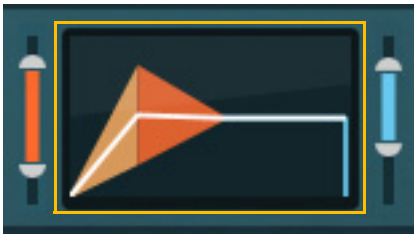## Articulation Display

The display illustrates the Articulation parameters. When you play a note, a white line shows its velocity and the resulting articulation curve.

You can also click and drag in the display to set the Sustain level manually.

Sustain Control
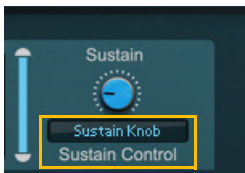
This lets you select how to control the sustain level. Most patches included with Friktion use the Mod Wheel for this, but it's also possible to select Expression, Breath Control, Pressure, or Sustain Knob. In that mode a dedicated Sustain parameter appears, allowing you to set a fixed sustain level and save a patch using that. It can also be a good alternative when you're using the Mod Wheel for other purposes. Note that you can also adjust the Sustain level by clicking and dragging in the display!

Sustain knob

This is available when "Sustain Knob" is selected on the Sustain Control menu (see above).

Resonator Body

The Resonator simulates the body of the modeled instrument by utilizing formant filters. It has a huge effect on the final sound.

Type (Resonator Select)

→ **Click the name and select between a number of different Resonator bodies.**
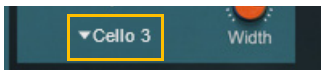   Alternatively, drag the body image up/down.

► Don't hesitate to combine high-register tones with large resonator types or vice versa! It can also be very interesting to tweak the size of a resonator with the Size parameter.

• **The "Dry" option bypasses the Resonator section completely, which can be useful if you want to apply other resonator types using a convolution reverb such as RV-7000 MkII.**

Resonator Size

Simulates changing the size of the resonating body, which will affect the frequency curve for wildly different sounds.

Resonator Smear

Evens out the frequency spectrum. This can make the sound more realistic when you're playing ensemble sounds (in Doubling mode, see "Reverb and Doubling"), since it emulates different players having slightly different instruments.

Resonator Direct

This mixes in a portion of the direct string sound with the resonator sound. Turning it up adds more high details and presence.

Resonator Width

All impulse responses used in the Resonator section are recorded in stereo. The higher the Width setting, the more this stereo sound is preserved, and the wider the stereo effect.

Reverb and Doubling

Reverb On

Turns the reverb effect on.

Reverb Type

Six different reverb types, emulating rooms and halls of various sizes and shapes.

→ **Click the Reverb Type name and select the desired space.**
   Alternatively, drag the image up/down.

Reverb Level

The overall level of the reverb effect.

Reverb Early Reflection Level

The amount of early reflections in the reverb sound. These are also affected by the selected reverb type and the Stereo Image parameter.

Reverb Decay

The decay time of the reverb.

Doubling On

Switches from solo sounds to ensemble sounds by adding multiple instances of the string model.

The different "players" will have slightly different Glide times, vibrato phases/rates and more, by random amounts.

Number of Players

Select how many players should be emulated, from 2 to 4.

→ **Click and drag up/down in the display to select number of players.**

Random Timing

Introduces timing differences between the players, for a more natural ensemble sound. Raise this for more pronounced timing differences.

► **To best hear the effect of the Timing parameter, and set it accordingly, switch to Pluck mode!**

Stereo Image

This parameter emulates moving the microphones apart when Doubling is on, and also affects the stereo image of the early reflections in the Reverb section. Higher values give more pronounced stereo effect.

EQ

This Equalizer has high and low shelving bands with fixed frequencies, plus a parametric mid band. Use it to tailor the sound as needed.

Lo Gain

Specifies how much the level of the low band should be boosted (positive values) or lowered (negative values).

Hi Gain

Specifies how much the level of the high band should be boosted (positive values) or lowered (negative values).

Freq

This determines the center frequency of the EQ, e.g. at which frequency the level should be decreased or increased.

Q

This governs the width of the affected area around the set center frequency. The higher the value, the narrower the affected frequency range.

Gain

Specifies how much the level of the selected frequency range should be boosted (positive values) or lowered (negative values).

Vibrato
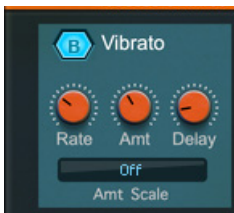
Vibrato On

Turns on the vibrato effect, causing the pitch to vary continuously.

→ **Toggle vibrato on or off by pressing the Vibrato key (B1).**
   This also lets you control the Vibrato Amount (see "Vibrato Amount") from Keyboard Velocity.

! **While vibrato often sounds natural on bowed notes, it may sound unusual if you switch to Pluck mode. It's possible to have vibrato automatically turn off when you press the Pluck key by using a routing in the "Modulation Matrix". See the Violin Solo patch included with Friktion for an example of this.**

Vibrato Rate

The speed of the vibrato, in Hz.

Different notes (as well as different "players" when Doubling is on - see "Reverb and Doubling") will have vibrato with randomly varying phase and speed.

Vibrato Amount

How much the pitch is affected by the vibrato.

! **Vibrato can also act as a source in the "Modulation Matrix", for modulating other parameters than pitch. In that case, the Amount parameter doesn't come into play, since the Mod Matrix has its own Amount column (Rate and Delay still apply though).**

Vibrato Delay

Delays the onset of vibrato after a note is played.

! **If you activate vibrato by pressing the Vibrato Key (B1), there will be no delay.**

Scale Amount

If you select a performance controller on this popup menu, you can control the amount of vibrato using that control (with the Amount parameter setting the maximum amount).

► **Select the same performance controller here and on the Sustain Control popup (Articulation section) to have vibrato increase along with articulation. This can sound very expressive.**

Tremolo
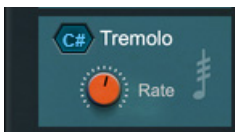
Tremolo On

Turns on the Tremolo effect, causing rapidly repeating notes. On a violin this would be done by bowing quickly back and forth. On a plucked instrument such as a mandolin it would typically be done by playing up and down with a pick.

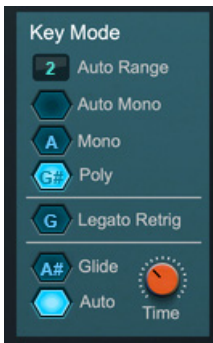→ **Temporarily toggle this with the Tremolo key (C#1).**

! **When Tremolo is on, Articulation affects the overall dynamics of the held note, rather than each quick repeated attack. This means you can hold a tremolo note and let it swell or fade with the Sustain control in the Articulation section (see "Articulation").**

Tremolo Rate

The speed of the tremolo, in Hz.

Key Mode

Auto Mono/Mono/Poly

There are three modes:

- **Auto Mono:**
  Friktion is polyphonic but notes played legato within the Auto Mono range will be monophonic. This allows for natural legato playing, with Auto Glide mode also affecting the result. See "Auto Range" for more details and examples.

- **Mono:**
  Friktion is monophonic when you play notes after each other. You can still play a chord if you play several notes at the same time (like playing double stops on a violin for example - this is also true for Auto Mono mode).

- **Poly:**
  Friktion is polyphonic and will not apply Legato or Auto Glide.

→ **Temporarily toggle between the current mode and one of the other modes by pressing the Mono key (A1) or Poly key (G#1).**
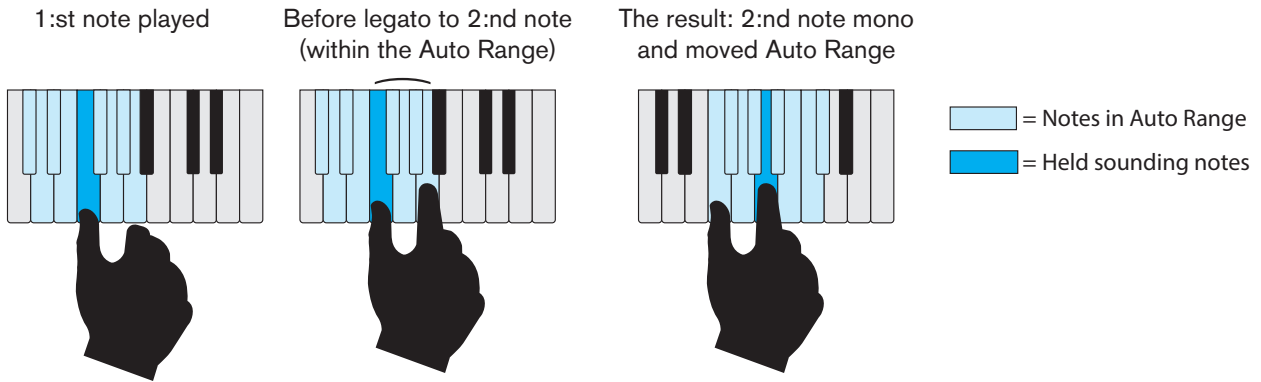
Auto Range
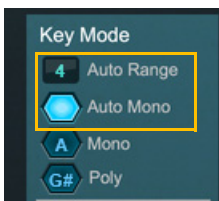
In Auto Mono mode, if you play a note and follow it by another played legato (with no gap between the notes), the new note will cut off the previous one with a Legato or Auto Glide effect applied - if the two notes are within this range.
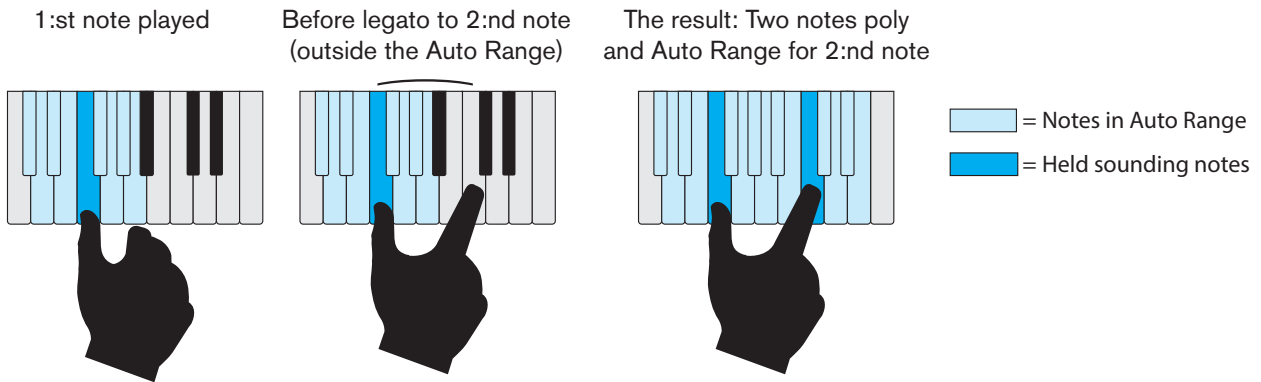
→ **Drag up/down in the Auto Range display to set the desired (+/-) note range.**

Below are two examples of Auto Mono mode with the Auto Range set to (+/-) 4 notes:

1:st note played	Before legato to 2:nd note (within the Auto Range)	The result: 2:nd note mono and moved Auto Range

□ = Notes in Auto Range
■ = Held sounding notes

Playing legato within the Auto Range.

1:st note played	Before legato to 2:nd note (outside the Auto Range)	The result: Two notes poly and Auto Range for 2:nd note

□ = Notes in Auto Range
■ = Held sounding notes

Playing legato outside the Auto Range (and holding the notes).

Legato Retrig

Normally, legato notes are "fingered". When this is on, legato playing will result in a change of bow direction for each note, with the articulation envelope retriggering.

→ **Temporarily toggle this mode on or off by pressing the Legato Trig key (G1).**

Glide modes

There are three modes:

• **Glide On:**
  The pitch will glide from note to note at the set Glide Time. The result also depends on the interval between notes, whether you play legato or not and the velocity.

• **Auto Glide:**
  When you play legato in Auto Mono or Mono mode, the pitch will glide from note to note. The glide rate depends on velocity (play softly for pronounced glide) and how fast you alter between notes (with fast trills giving little or no glide). The overall rate is adjusted with the Glide Time parameter.

• **Glide Off (no button lit):**
  No glide is applied.

→ **Temporarily toggle Glide by pressing the Glide key (A#1).**
  In Auto Glide or Off mode, this will switch to Glide On; in Glide On mode it will switch to Glide Off.

Time

Affects the glide time applied in Glide On or Auto Glide modes.

LFO

The Low Frequency Oscillator produces a continuously varying waveform. It is per-voice, meaning it runs independently for each played note.

Rate

Sets the rate of the LFO in Hz. The rate can be selected as a source and destination in the Mod Matrix and thus be modulated by other sources.

Waveform selector

→ **Drag the waveform image up/down to select the desired waveform.**
  10 different waveforms are available.

Mod Envelope

This is a simple Attack/Decay envelope. It can be used to change the timbre over time, add some extra noise to the attack etc.

Env Attack

The attack time of the envelope, in ms.

Env Decay

The decay time of the envelope, in ms. This is actually both decay and release, meaning that after the attack phase, the envelope will fall to zero regardless of whether you hold the key or release it.

Modulation Matrix

The Modulation Matrix allows you to modulate parameters, using performance controllers, built-in Envelope and LFO, or CV signals from an external device.

The Modulation Matrix has four rows, each with the following fields:

Source

Selects which modulation source signal to use:.

Parameter	Description
Velocity	How hard the note is played.
Envelope	Select this to modulate a parameter with the built-in Envelope.
LFO	Select this to modulate a parameter with the built-in LFO.
Vibrato	Allows you to use the vibrato signal as a modulation source for other things. The Rate and Delay settings in the Vibrato section still apply, but not the Amount. Therefore, if you want to use Vibrato as a separate extra LFO but not have a conventional Vibrato effect at the same time, turn down the Amount parameter in the Vibrato section.
Random	A new, bipolar random value for each played note. Great for introducing some variation between notes.
Key	The current key played. Higher keys give higher modulation values.
String (Violin), String (Cello)	See below for details.*
Mod Wheel, Breath, Expression, Pressure	Allows you to route standard performance controls to other parameters. These are also available on the Sustain Control and Vibrato Scale Amount pop-up menus.
AuxKey C	The C1 key in the Control octave has no built-in function, but can be routed to a parameter here, for performance use.
AuxKey C Latched	Same as above, but will only affect notes triggered while the key is held. The effect will remain for the duration of the note. This means you can hold one note, press AuxKey C (Latched) and play another note, and the modulation will only affect the second note.
TremKey C#	Lets you adjust parameters automatically when you turn on Tremolo by pressing the Tremolo Key (C#1). This can be for a more natural sound or for special effects.
PluckKey D	Lets you adjust parameters automatically when you toggle between Bow and Pluck mode with the Pluck Key (D1).
CV 1-2	Lets you use signals from the two CV inputs on the back of Friktion, for example by hooking up the Pulsar Dual LFO or other devices.
Pitch Bend	Lets you use Pitch Bend as an additional controller source. If you don't want the pitch to be affected too, set Pitch Bend Range to zero.

* About the String (Violin) and String (Cello) sources:

On many instruments, the different strings sound different - typically the lower, larger strings are less bright. These modulation sources allow you to emulate that and other per-string differences.

String (Violin) looks at the pitch of the current note (taking Octave Transpose into account) and assumes that it's played on the string that's closest below that in pitch. It uses the standard tuning of violin strings as reference and outputs a modulation offset value that is higher for higher strings:

String (Violin)	Offset
G (G2)	0
D (D3)	0.5
A (A3)	0.8
E (E4)	1.0

This means that if you play an F3, Friktion assumes that you're playing the D string and the "String (Violin)" source outputs the value 0.5.

! **Note that this value does not change if you play legato, since you're then playing new notes "on the same string".**

→ **Assign this modulation source to the High Damp parameter to make the different strings progressively brighter (or darker, if a negative amount is used).**

The String (Cello) source works exactly the same, but uses the standard tuning of cello strings as reference instead:

String (Violin)	Offset
C (C1)	0
G (G1)	0.5
D (D2)	0.8
A (A2)	1.0

Amount

The amount of modulation. This is bipolar (you can set a negative or positive modulation value).

Destination

Determines which parameter is modulated;

Parameter	Description
Pitch	
Articulation	Controls the Articulation amount.
Bow Pressure	
Bow Noise	
Bow Position	
Hi Damp	
Hi Damp Slope	
Harmonic Touch	
Harmonic Position	
Tremolo Rate	
Vibrato Amount	
Vibrato Rate	
LFO Rate	
Env Decay	Controls the Mod Env Decay
Accent	Controls the Bow Accent

Scale

Selecting a source here means the modulation is scaled by that source.

For example, if you set up a modulation like this:

Source	Amount	Destination	Scale
LFO	50	Hi Damp	Mod Wheel

then the LFO will modulate the Hi Damp Frequency parameter, but the modulation will be scaled by the Mod Wheel. When the Mod Wheel is at zero, there will be no modulation at all. Raising the Mod Wheel will gradually increase the modulation up to the set Amount (50).

Rear panel connections
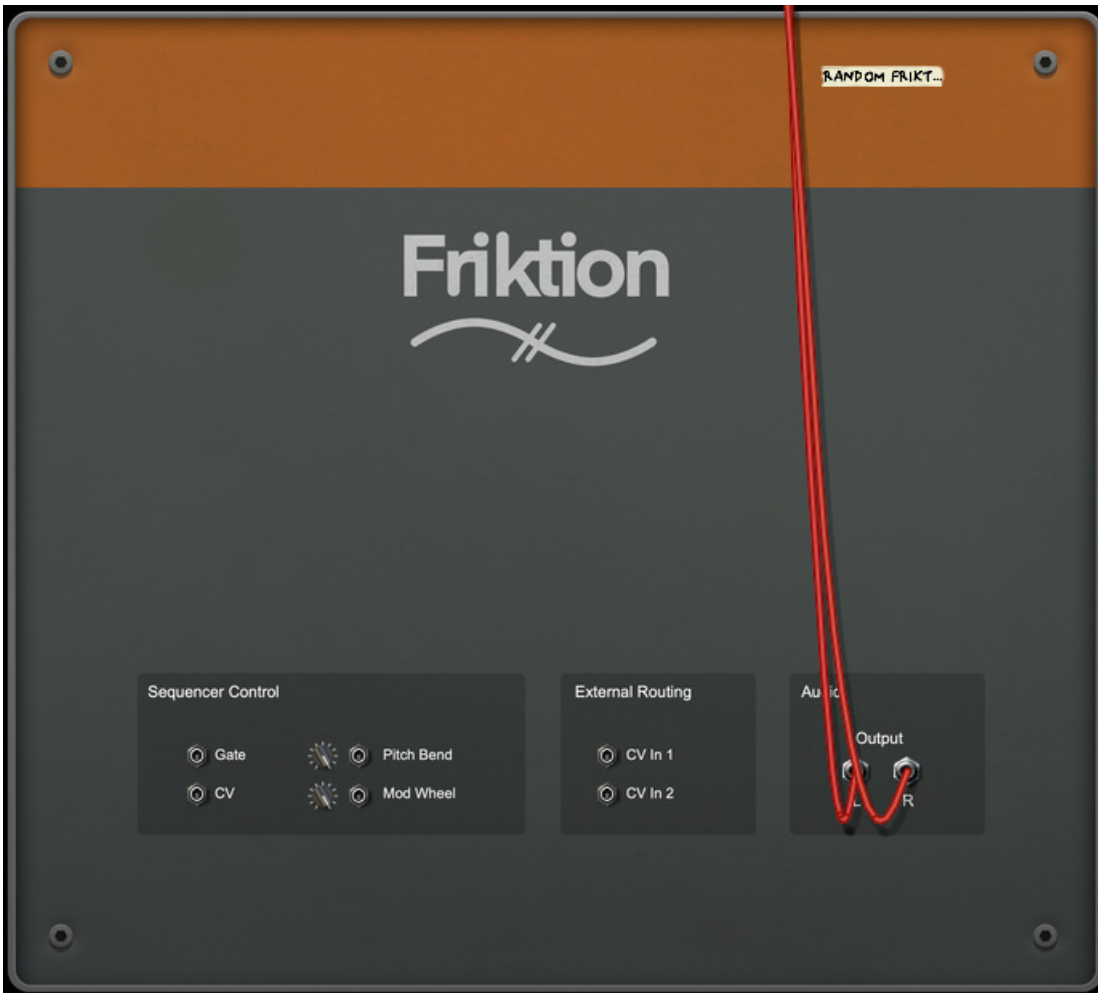
! **Remember that CV connections are NOT stored in the Friktion patches! If you want to store CV connections between devices, put them in a Combinator device and save the Combi patch.**

Sequencer Control inputs

The Sequencer Control CV and Gate inputs allow you to play Friktion from another CV/Gate device (typically a Matrix or an RPG-8). The signal to the CV input controls the note pitch, while the signal to the Gate input delivers note on/off along with velocity. There are also inputs with attenuation knobs for modulating the Pitch Bend and Mod Wheel parameters.

External Routing CV In

These control voltage (CV) inputs can be used for modulation source signal modulation via the Modulation Matrix (see "Modulation Matrix").

Master Out

These are the main audio outputs.

Tips & Tricks

Dynamics control with Players

If you are playing Friktion using a Player device (e.g. PolyStep Sequencer or Dual Arpeggio) the Player also controls the note Velocity. The Player typically sends out short notes, which might make the Sustain control in Friktion's Articulation section non-functional; the notes from the Player are too short to make Friktion's notes reach the sustain stage.

To be able to get dynamic variation in Friktion, here is what you can do:

1. **Adjust the Velocity to Start Level in the Articulation section to approximately 50-60%.**

A PolyStep Sequencer Player controlling Friktion

2. **Select e.g. Mod Wheel as source for the Sustain Control (to the right of the Articulation display).**

3. **Control the overall dynamics by adjusting the Mod Wheel.**