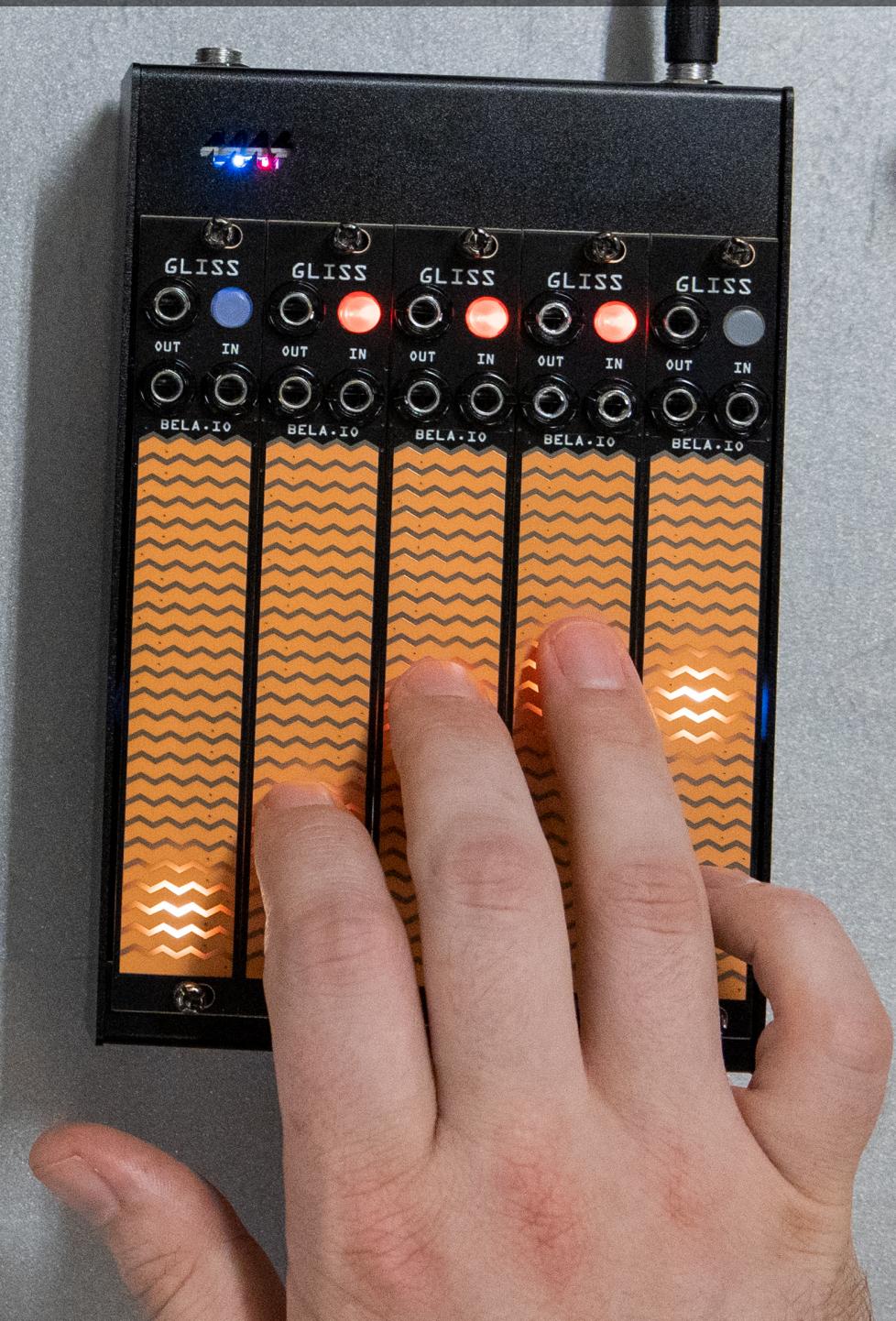


# GLISS

A touch controller for  
modular synth

## User Manual



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# INTRO

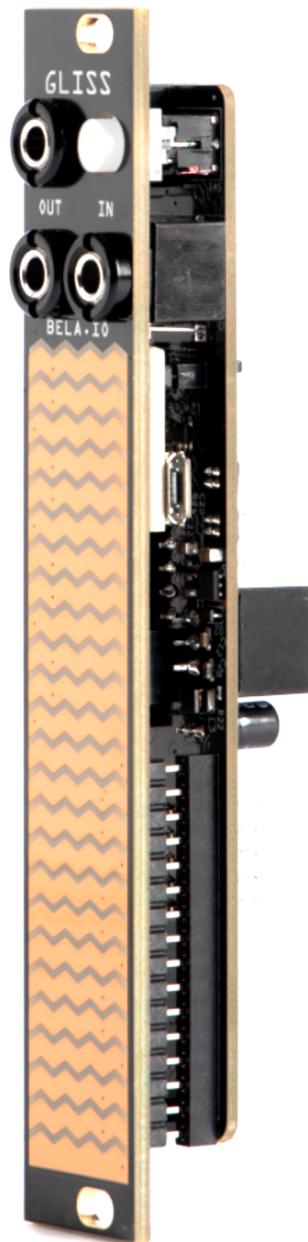
**Gliss is a touch controller for your modular synth.**

Introducing gestural control into synthesis is as old as the field itself and covers a wide range of implementations, from antennae, sensors, and joysticks, to touch pads, buttons and wheels.

Traditionally, musical instruments are based on a physical interplay between human and apparatus, so trying to introduce this type of interaction into the abstract world of early electronic instruments made intuitive sense. But one of the key strengths of electronic instruments was exactly that: they were not like their traditional predecessors. The departure from physical interplay toward a programmed language was and remains a crucial component of their appeal.

Gliss treads a middle ground between these 2 poles. It offers high-precision touch control that brings physical interaction into your synthesiser setup, but crucially provides a powerfully practical tool for generating and managing control voltages in your modular system, whether you're interested in the aural style that touch control produces or not. That both ideas are simultaneously available is Gliss's core strength.

Powered by the technology behind Bela's Trill capacitive touch sensors, Gliss produces 2 high-resolution signals: one following your finger's



position, the other following touch size. These signals are available via 2 CV outputs, offering 2 distinct but related dimensions of control to route around your system. Gliss can record both gestures for up to 60 seconds. This is an incredibly useful tool that allows you to create exactly the modulation you've imagined for a certain parameter in real time, rather than delicately fine-tuning a patch of different modulation sources. The recorded gesture can then be looped to create custom LFOs at low rates or custom oscillators in the audio rate domain.

Despite its compact size, Gliss is a powerful visualisation tool that diffuses LEDs through its faceplate to provide clear feedback of both internal and external signals. These both illuminate and track your gestures but also give clarity to external modulation sources. What's more, those external signals can be clipped, offset, scaled, and smoothed on the fly by touch, expanding CV utility work into an interactive, performative domain.

Gliss also packs in a variety of features through its concise Menu system, providing a tuneable 5-key keyboard with glissando and vibrato, 5-step sequencer, waveshaper, wavetable, and much more. Gliss is also open source, allowing users to hack, remix and extend the module.

## 1 controller, 4 Performance Modes

Gliss's touch functionality exists over 4 Performance Modes. These are:

### CONTROL

Generate CV and gate signals based on your precise finger position and touch size (how hard you press on the sensor)

### RECORD

Draw waveforms directly into your system and record gestures of up to 60 seconds, then play it back in a variety of ways (like looping to make a custom LFO, triggering it as an envelope, and much more)

### SIGNAL

Along with visualising any signal, you can scale, offset and smooth CVs performatively, outputting the processed signal, an envelope of the input, or both

### NOTES

5 notes at fixed, user-configured voltages that can be used as an expressive keyboard with 5 pressure-sensitive buttons, or as a step sequencer that's played using an input signal

## The Menu and other controls

The Menu is central to Gliss. You'll use it to step between Performance Modes, customise the Mode you're in, and set your Mode's voltage ranges. Along with this Menu for Mode settings, more high-level settings can be found in the Global Settings, and you can also recalibrate Gliss at any time using Calibration Mode. You'll find full explanations of everything in this manual.

## About this manual

This manual has been written to guide you through all the functions of Gliss, from basic to advanced. To get the most out of Gliss we recommend you follow this manual step by step with the module in front of you. Gliss has been designed to grow with you over time and has many surprises and hidden talents, which we'll explain in this guide.

Something missing? Spot a mistake? Have a suggestion? We'd love to hear from you:  
[info@bela.io](mailto:info@bela.io).

Manual version 1.0, July 2023

# HELLO GLISS

## Technical specifications

Width: 4 HP

Depth: 27mm

+12V: 150mA

-12V: 30mA

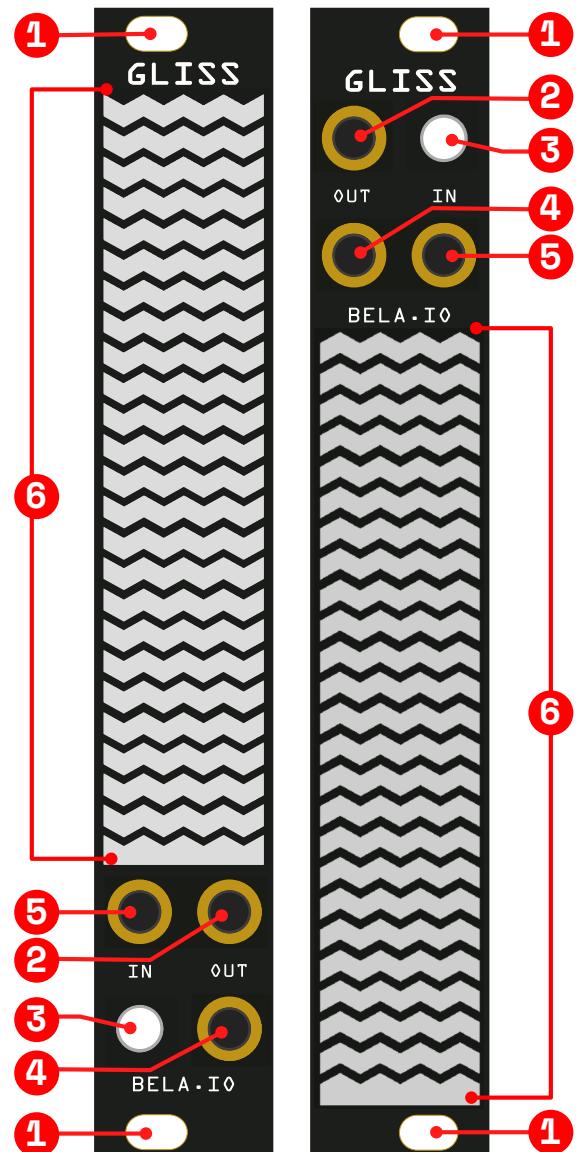
Voltage rating: Input and outputs are  $\pm 10V$  safe.  
Usable range for both input and outputs is -5V  
to +10V

## Physical features

Gliss has 6 physical features (see diagram):

1. Mounting holes
2. Top Output
3. The Button
4. Bottom Output
5. Input
6. Touch Strip

Gliss comes with a faceplate installed that places the jacks and button at the top. We also include another faceplate with the jacks and button at the bottom, so you can choose the orientation that works best for you and your setup. The function of the physical features are identical, no matter which orientation you choose.



## Touch Strip

Gliss's main feature is a large capacitive touch surface called the Touch Strip. It senses your finger position with sub-millimeter accuracy and reads single or multiple touches depending on the Mode.

Additionally the Touch Strip senses touch size, which refers to how much of your fingertip makes contact with the surface. This is broadly equivalent to pressure sensitivity: pushing harder will result in a larger output voltage, and softer in a smaller one.

The Touch Strip is backlit by a column of 23 LEDs, which provide important visual feedback in all Modes. For example, in Record Mode the LEDs visualise the movements of your recorded gestures, and in Signal Mode the LEDs display the voltage of the connected signal.

## The Button

Gliss features a physical button. The Button is used for triggering playback of recorded gestures, arming the module for recording loops, and navigating the Menu and Global Settings. The Button is illuminated, and can display 3 colours (green, red, and yellow).

## Control Voltage Input

Gliss has one input, a mono 3.5mm jack. Use the Input to connect clock signals, triggers, and control voltage signals to Gliss. The Input voltage range is -5V to +10V, and is fully customisable in each Mode.

## Control Voltage Outputs

Gliss has 2 mono 3.5mm jack outputs - the upper is the Top Output, and below it is the Bottom Output. Both outputs are used to send CV signals, gates, and triggers to other parts of your synth. Each output voltage range is -5V to +10V, and they're individually configurable on the fly. This means Gliss's output voltages can always be set to the perfect range for the other modules and instruments it's controlling in your rack.

## Installation

1. Disconnect your Eurorack case from any power.
2. Connect the 2x5 pin side of the Gliss power cable to the 2x5 pin header on the back of Gliss. Ensure that the red stripe is aligned with -12V.
3. Connect the 2x8 pin side of the Gliss power cable to the 2x8 pin header on your Eurorack power supply. Ensure that the red stripe is aligned with -12V.
4. Line up the mounting holes with the rail in your case, and attach Gliss using the included screws.
5. Power up your Eurorack system, and enjoy Gliss!

## Getting started

Throughout this guide we will suggest ways for you to try out to hear and understand how the module performs, but here's 3 ideas to get you started right away after installation.

### Visualise finger position and touch size

Turn on Gliss. You will be in **CONTROL** Mode.

Slide a finger on the Touch Strip. A red pointer will illuminate your finger position.

Now vary your touch size, by pressing down harder. The pointer will get bigger and smaller in response.

### Sonify your finger position

Connect the Top Output to the frequency of a voltage-controlled oscillator (VCO).

Slide your finger up and down the Touch Strip to hear the frequency change. The position on the Touch Strip will correspond to what comes out of the Top Output. (This will be in Gliss's default 0-10V voltage range. Don't worry if that's not ideal, we'll learn how to customise voltage ranges later.)

### Sonify your touch size

Now, connect the Bottom Output to the amplitude CV in of a voltage-controlled amplifier (VCA).

Vary how hard you're pressing on the Touch Strip, and observe the change in amplitude. Your touch size corresponds to the signal coming out of the Bottom Output (again, this will be 0-10V by default). This might be very loud, so be careful!

## The faceplates

Gliss comes with a faceplate that places the jacks and Button at the top of the module. It's attached using 2 strips of pin connectors, and secured in place with 3 nuts on the mono jacks.

However, we know that not every setup, synth, or musician is the same. Some people want the jacks and Button at the bottom, or at least want to be free to change their mind. To accommodate, we have also included a second faceplate with the jacks and Button at the bottom.

If you prefer the jacks and Button at the top, your Gliss comes ready to install. If you want to swap the faceplate, follow the directions below.

## Swapping faceplates

To swap the faceplate, do the following:

1. Disconnect Gliss from all power. If it's in your rack, unscrew the mounting screws and remove the power cables.
2. Loosen the jack nuts and remove them.
3. The faceplate will still be attached with 2 rows of pins, which have to be loosened so the faceplate will come off. You can do this by placing a flat-headed screwdriver between the faceplate and the module. Carefully loosen the pins on one side, then switch to the other side of the module and repeat. You'll have to go back and forth a few times until the pins are loose enough on each side to remove the faceplate. Be careful here - if you bend the pins you'll have difficulty putting the faceplate back on!
4. Using the new faceplate, line up the 2 rows of pins with the headers on the back. Press down gently, checking one side and then the other, until they're fully in place. Go slowly, and when you're sure the pins are settled, give it a gentle press to settle all pins completely into place.
5. Reattach the jack nuts, reattach Gliss to the power supply and replace the mounting screws. Gliss is now ready to go!

You can now install Gliss back in your case, but you'll have to swap its orientation in the Global Settings menu so everything works as expected (see the Global Settings section for instructions).

# THE INTERFACE

## The 4 Performance Modes

Gliss features 4 Performance Modes, which allow you to manipulate and perform with your signals in real time. These are:

### CONTROL

Control signals in real time, with the touch of a finger

### RECORD

Record and play back gestures for custom modulation signals, LFOs, and envelopes

### SIGNAL

Clip, scale, offset, smooth, and visualise your signals

### NOTES

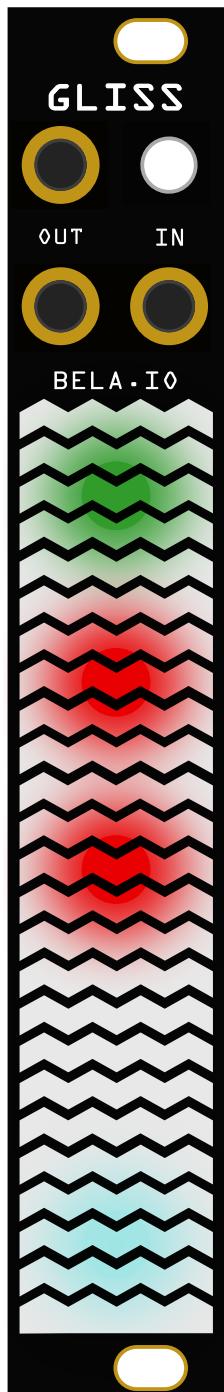
A set of notes, playable as a keyboard or a step sequencer

Each of these Modes is thoroughly customisable, using the settings in the Menu. A full explanation of each Performance Mode and each of their available settings follows this chapter.

## The Menu

The Menu is the central control interface of Gliss, and is always accessible. In the Menu you can:

- Customise the behaviour of the current Mode by changing the settings (we go into this in detail later in this manual)
- Move between Modes
- Customise the voltage ranges for the Input and Outputs for the current Mode



### The Menu

Above is a diagram of the Menu, with 3 sections: Mode Selector (1), Settings Selectors (2), and Voltage Range Selector (3).

## Accessing the Menu

You can access the Menu at any time by doing the following:

1. Hold down the Button
2. Tap the Touch Strip with 2 fingers
3. Release the Button

To exit the Menu and use your current Mode, tap the Button.

## Using the Menu

When you're in the Menu you will see a Mode Selector at the top (green), then up to 3 Settings Selectors (red by default), and the Voltage Range Selector (blue/white). Refer to the diagram on the left.

### 1. Mode Selector

The Mode Selector is used for cycling between the 4 Performance Modes. Tap the Mode Selector to step to the next Mode. A brief animation representing the current Mode will be played. You can skip the animation and continue to the next Mode by tapping the Mode Selector again.

### 2. Settings Selectors

The Settings Selectors (either 2 or 3, depending on the Mode) allow you to change settings in your current Mode, in order to fully customise its behaviour. In the majority of cases these Settings Selectors allow you to cycle through the set of available options by tapping, but there are 2 instances in which they function as continuous input selectors. We explain how these work below in “Some notes on Selectors,” while Mode-specific functions are described in each Mode section.

### 3. Voltage Range Selector

The input voltage range, as well as the voltage range of each output, are customisable for every Mode. By default these are configured to 0V to +10V, but the full available voltage range is -5V to +10V. To customise the voltage range for a given Mode, tap the voltage range selector, then follow the steps listed in the “Configuring voltage ranges” section below.

### The Menu vs Active Mode

Each Performance Mode consists of a Menu for customising, and an Active Mode where you can use the settings you've chosen. To enter Active Mode from the Menu, just press the Button. To get back to the Menu, hold down the Button, tap the Touch Strip with 2 fingers, and release the Button.

## Some notes on selectors

There are 2 different types of Settings Selectors in the Menu: Discrete and Continuous. They look the same but their behaviour is different when they're tapped.

### **Discrete** selectors

Most Settings Selectors are **Discrete**, meaning that they represent a group of related settings (from 2-5). Tap the Selector to step through the settings in this group. The selector colour indicates its order in the group. The colour order is:

-  **Red**
-  **Orange**
-  **Gold**
-  **Green**
-  **Blue/white**

### **Continuous** selectors

Along with discrete selectors, there are 2 that are **Continuous** (in Signal Mode and Notes Mode). This means that instead of representing a group of settings, this Setting Selector represents a single setting that can be set between a minimum and maximum value, like a slider.

When you tap one of these continuous Setting Selectors you'll see a pulsating point on the Touch Strip, which represents the setting's current value. Slide it with your finger to adjust. When you slide the pointer over the Touch Strip, it will change colour at a specific point, which indicates the default setting in case you want to return to it.

### **Resetting** selectors

Any Settings Selector - discrete or continuous, in any menu - can be returned to its factory state by pressing it and holding for 3 seconds.

## Configuring voltage ranges

Voltage ranges are a critical aspect of any modular system, as the voltage requirements change across modules, systems, and applications.

Gliss comes with all voltage ranges configured to 0 to +10V (the full voltage range is -5V to +10V), but you can configure the voltage ranges for the Input and Outputs individually for each of the 4 Performance Modes.

The Voltage Range Customisation Menu is accessible in every Mode from the Menu, by tapping the Voltage Range Selector. Any customisation you make applies only to the ranges for the Mode you're currently in, and no other ranges will be affected.

## Access the voltage range menu

Enter the Menu (hold down the Button, tap the Touch Strip with 2 fingers, release the Button). At the bottom is the blue/white Voltage Range Selector. Tap it to enter the Voltage Range Menu. You'll see 3 gold selectors.

To exit the Voltage Range Menu and return to Active Mode, press the Button.

## Select a range to customise

The Voltage Range Menu has 3 gold selectors. Starting from the top, these are:

1. Input voltage range
2. Top Output voltage range
3. Bottom Output voltage range

Tap a selector to start customising that range.

## Customising the voltage ranges

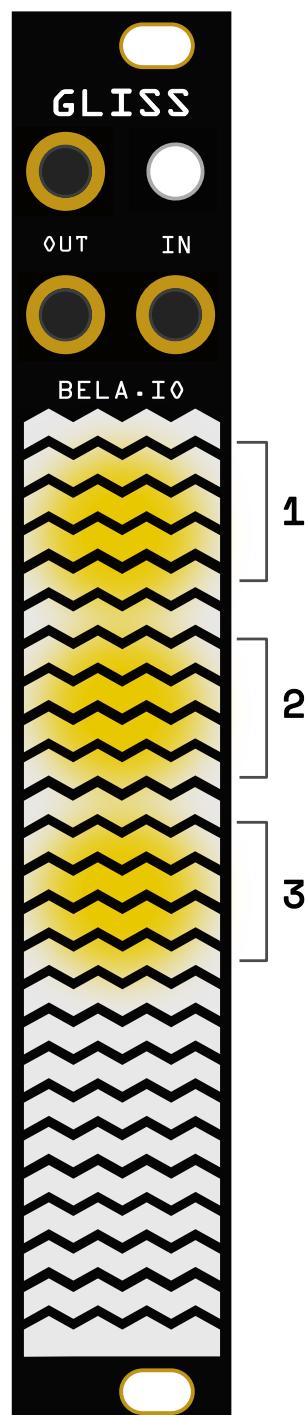
Customising the voltage range means that you specify the minimum and maximum voltages that Gliss can receive from or send to other devices when it's in a particular Mode. The voltage ranges you set are specific to the current Mode, and will be remembered when you switch off your module and turn it back on again at a later point. This is to make Gliss as flexible as possible as a performance tool.

There are 2 ways to customise the voltage range: Choose a preset, or set the range manually.

### Use a preset

From the Voltage Range Menu tap the Selector for the Input or Output you want to customise. Every time you tap the selector, you cycle through the preset ranges, which will be displayed by a highlighted range on the Touch Strip:

- 0V to +10V (default; shown in the diagram on the following page)
- -5V to +5V
- 0V to +5V
- -5V to +10V



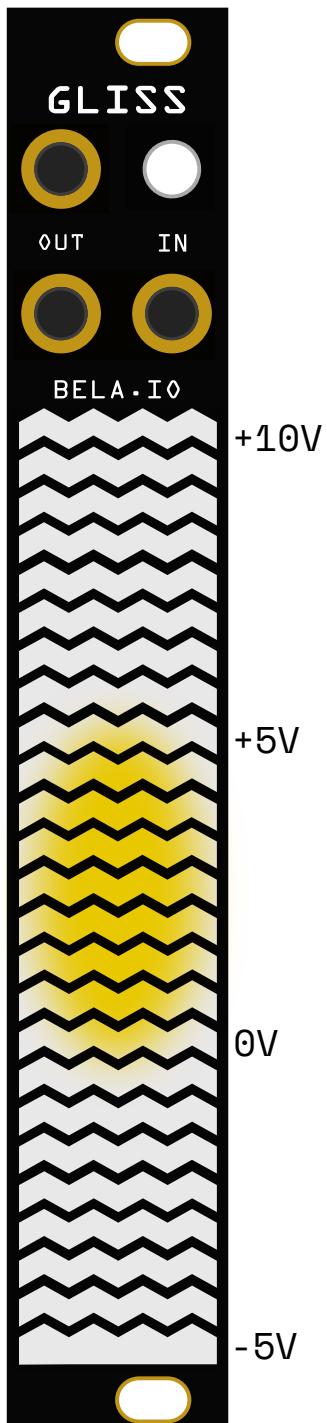
**The Voltage Range Menu**

Selectors, from the top:

1: Input

2: Top Output

3: Bottom Output



Customising a Voltage Range

Above is a diagram showing a voltage range set from 0V to +5V.

### ***Set a custom range manually***

If you don't want to use one of the presets, you can set a custom range.

From the Voltage Range Menu, hold the selector for the input or output you want to customise for 2 seconds. After 2 seconds 2 touch points will appear on the Touch Strip, which represent the minimum and maximum voltage levels for this input or output. Using 2 fingers, you can drag these to your desired voltage range. As you adjust the range, the Input or Output you're adjusting will output a signal that oscillates between that minimum and maximum, so you can "hear" it as you set it.

The voltage range is quantised to 1V steps to make this easier. Be sure to keep a finger pressed to the Touch Strip while setting your range; removing it will set the range to that point and bring you back to the Voltage Range Menu.

### **TIP**

Having customisable voltage ranges for each Mode is really useful for controlling different modules. For example, 0 to +10V or 0 to +5V is most common for pitch control, but if you're using Gliss's output as a source of modulation an output range of -5V to +5V might make more sense, so you can, for example, control pitch bends in both directions around a fixed pitch. You can also think of setting a custom voltage range as opening a "window" for modulation in- and outputs. Say you have a sequence of voltages from a sequencer covering a range of 0 to +10V but you only want to use the values between +5V and +10V, or whatever range you need — you can set this window of useful values with a custom voltage range.

## Global Settings

The Global Settings menu is available at any time by doing the following:

1. Hold down the Button
2. Tap the Touch Strip with 3 fingers
3. Release the Button

The selectors in the Global Settings menu apply to settings that are consistent across Modes, and that you will rarely have to adjust. Upon entering the Menu, you'll see 3 orange selectors and a red Selector at the bottom. From the top, these select Touch Sensitivity, LED Brightness, Toggle Menu Animations, and Module Orientation.

### 1: Touch Sensitivity

As well as sensing touch position, Gliss can sense touch size. Touch size is roughly equal to how hard you press on the Touch Strip. Pressing hard on the strip creates a larger touch size, and pressing lightly creates a touch size that's very small. Though Gliss is calibrated to be as responsive as possible, everyone's fingers, skin capacitance and touch habits are different. This selector allows you to scale the touch size by applying gain, to make it feel just right.

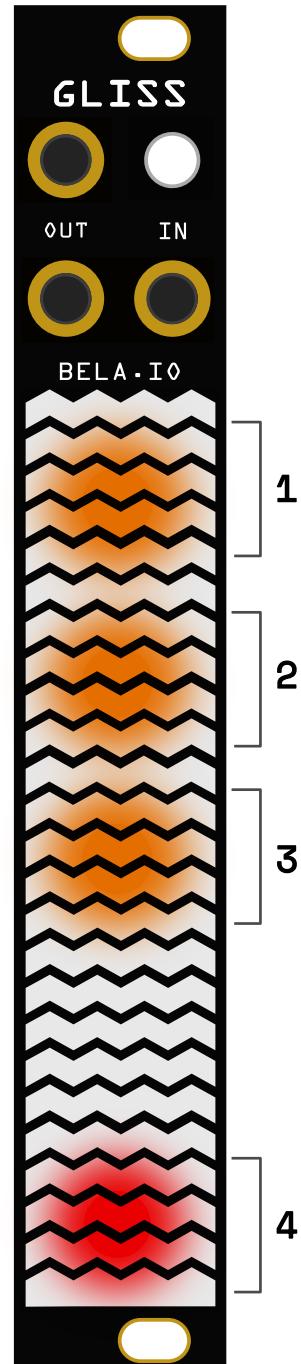
Tap the Selector to adjust Touch Sensitivity. The Selector will turn into a pointer. Slide your finger to adjust by sliding to the bottom (no gain applied) to the top (maximum gain). Lift your finger to finish adjusting.

While you are adjusting this setting, the touch size of your finger is processed through the gain and is sent out as a CV through the Bottom Output. You can use this voltage as a "preview" of the adjustment you're making, so you don't have to keep exiting this menu to try out your changes.

### 2: LED Brightness

This setting adjusts the brightness of the LEDs that illuminate the Touch Strip, so you can customise the brightness for maximum visibility in whatever context you find yourself. This is particularly useful when working with Gliss outdoors or in dimly lit conditions.

Tap the selector, and it will turn into a continuous slider. Place your finger on the illuminated point and slide to adjust it to the bottom (minimally bright) or the top (maximum brightness) of the Touch Strip. Lift your finger to finish adjusting.



**Global Settings**

Above is a diagram of the Global Settings menu, indicating the 4 selectors.

### 3: Toggle Menu Animations

This setting activates a series of animations which are shown on the Touch Strip while you're using the Menu, to help remind you of what each of the settings do. To better remember their function, we recommend going through the options with the manual or cheat sheet at hand at first. Once you are familiar with the Settings Selectors these animations can serve as a handy reminder of their function.

To turn the animations on, hold this Selector down for 3 seconds. When animations are active it will pulsate. Now, when changing a Mode's settings in the Menu, you'll see an animation reflecting the function of the parameter you've just changed.

### 4: Module orientation

Gliss comes assembled with a faceplate that puts the jacks and button at the top of the module. But, as every synth and setup is different, we included a second faceplate that places the jacks at the bottom. This allows you to choose the orientation that suits your own setup or change your mind later.

To select an orientation, press and hold the red selector on the bottom of the Touch Strip. A pointer will appear at either the bottom of the current orientation - this means that if it appears at the top of the Touch Strip, your current orientation does not match your faceplate. If the pointer is not at the bottom, slide it to the bottom and Gliss will invert its controls.

**Note that when you change orientation everything is automatically inverted.** This means that "Top Output" refers to the output that's highest, no matter what orientation you're in. There's nothing you have to remember or remap—by adjusting this setting, Gliss does all the work for you.

**Mode 1:**

# CONTROL

*Control signals in real time, with the touch of a finger*

Control Mode allows you to generate CV signals with the touch of a finger. There are options for combining control via finger position and touch size, or using 2 finger positions or 2 touch sizes.

## The Settings Selectors

### Selector 1: Control type

This setting allows you to choose your type of control. Tap the selector to step through the 3 options:

- **Single Slider**

A single touch point that outputs finger position (Top Output) and touch size (Bottom Output).

- **Dual Slider**

2 stacked sliders that each output finger position.

- **Dual Touch**

2 touch-sensitive pads, that each output touch size.

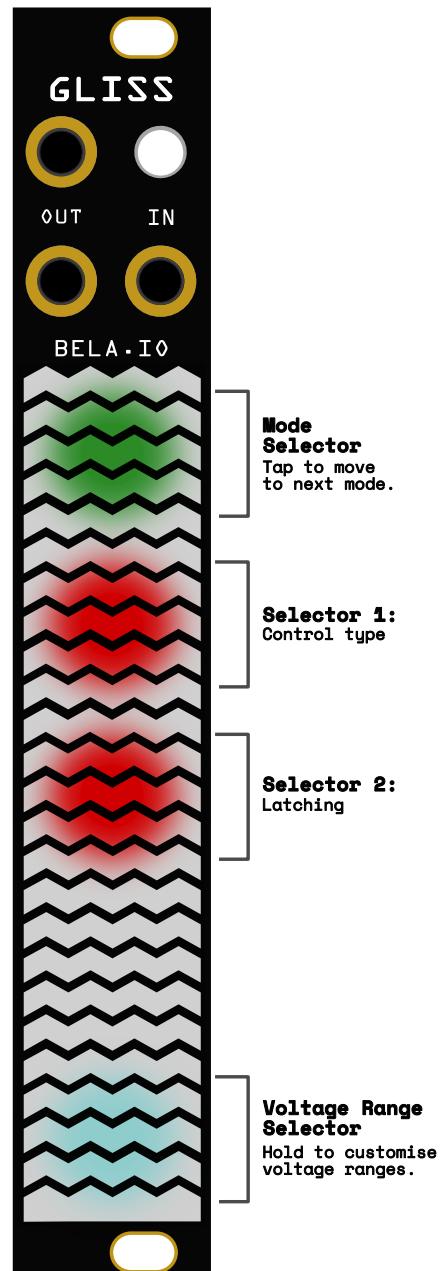
### Selector 2: Latching

Latching means holding the value when a touch ends. All control types from Selector 1 (Control Type) can use latching.

There are 3 options for latching:

- **Unlatched**

When you lift your finger off the Touch Strip, both CV outputs go to 0V.



### ● Latched

When you lift your finger off the Touch Strip, both CV outputs will be held at their last values (either position or touch size, depending on whether you're using Dual Slider or Dual Touch control type).

### ● Latch Position

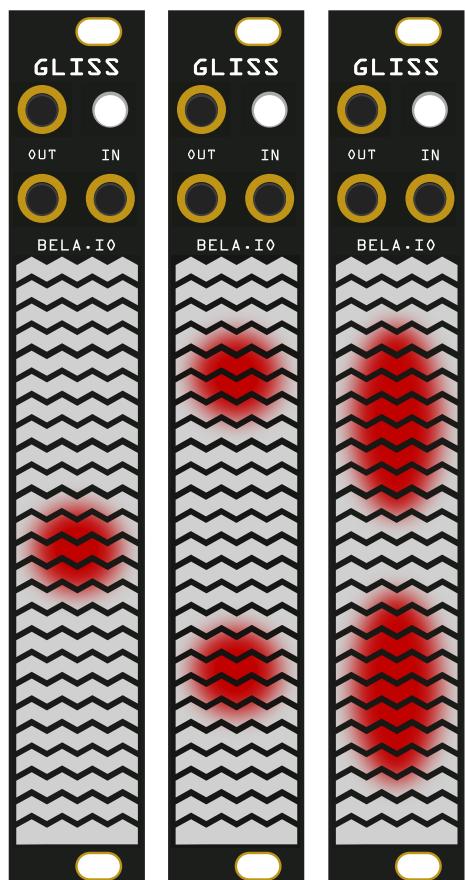
When you lift your finger off the control strip, any CV output mapped to position is held at the last value. This setting does not apply to touch size.

### Creative uses for latching

Latching position only can be a useful performance tool. Here's some ideas for using it:

- Latch position only, leaving touch size unlatched, if you are using Gliss to control the pitch of an oscillator and trigger an envelope. In this case, the touch position CV output used to control pitch is latched when you lift your finger off the Touch Strip, but you can still trigger your envelope using a GATE signal that is generated by touch size (GATE signals remain high for as long as your finger is on the Touch Strip).
- If you're controlling an oscillator's frequency with position and its volume via a VCA with touch size, try unlatching both those values. This will mean that the sound is only heard while your finger is on the Touch Strip.

*When you're using the Dual Slider control type you're only using half the Touch Strip for each slider. However, **this does not mean your voltage ranges are halved!** You still have the full voltage range available for each output, they're just scaled to fit half the Touch Strip.*



#### Touch control types

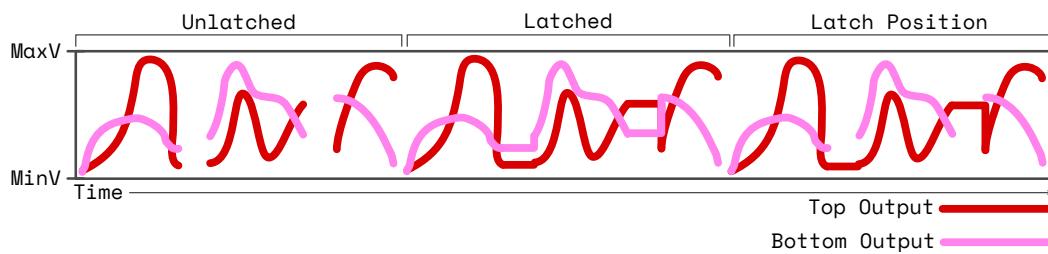
This diagram shows the three touch control types (Setting Selector 1). From left: Single Slider, Dual Slider, Dual Touch.

Latching is a subtle feature with lots of creative potential. As you patch with Gliss, try experimenting with different latching settings to develop an intuitive understanding of when a given type of latching is called for.

#### On-the-fly latching

You can also latch and unlatch your values on the fly. Here's how:

With a finger on the Touch Strip, press the Button. When you lift your finger, the current output voltages will be held. Place your finger on the Touch Strip to return to controlling with your finger, or press the Button to unlatch.



### Latching Types

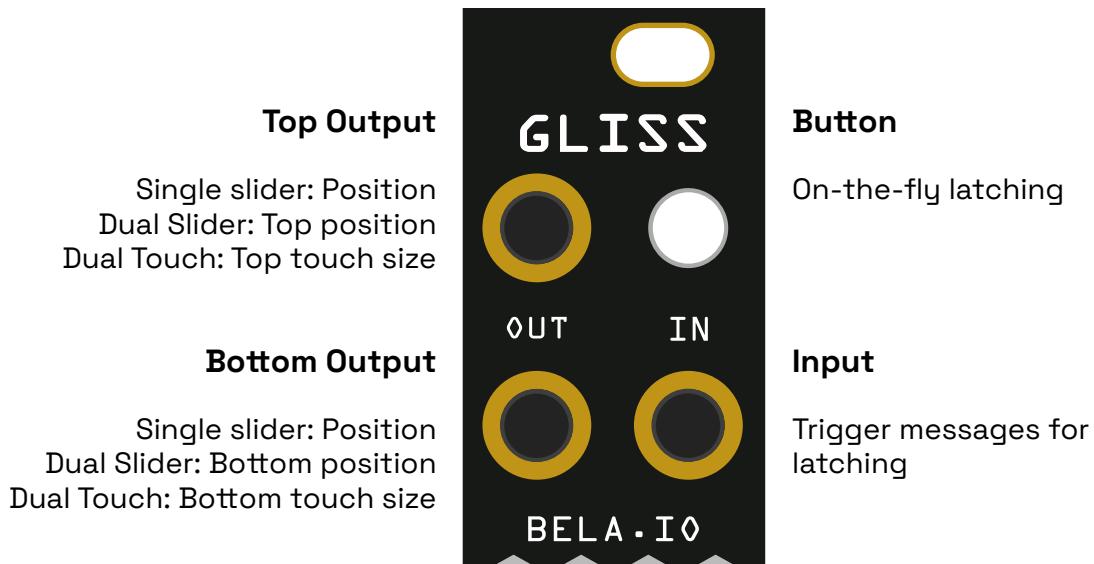
This diagram shows the different latching options (Setting Selector 2). The red line shows the value out of the Top Output, and the pink line From left: Unlatched (no held values); Latched (values from Top and Bottom Outputs held); Latch position (value from Top Output held).

Note that on-the-fly latching latches both position and touch size. If you'd rather only latch position, use the Latch Position setting instead.

### Using on-the-fly latching

Create a “sample and hold” effect by moving your finger on the Touch Strip, and pressing the Button multiple times. Every time you press the Button you “sample” a new touch position value, and it “holds” there until you either push the Button to unlatch the values, or update the output with a new touch.

## Input and Outputs



**Mode 2:**

# RECORD

*Record and play back gestures for custom modulation signals to use as LFOs and envelopes.*

In Record Mode you can record custom gestures up to 75 seconds in length. Gliss starts recording your gesture as soon as you place your finger on the Touch Strip, and saves your gesture when you lift it again.

Record Mode also offers a variety of ways to play your gesture back, enabling a huge range of ways to create modulation signals, such as custom LFOs, envelopes, and much more.

## The Settings Selectors

### Selector 1: Touch input type

There are 3 options:

- **Single Slider**

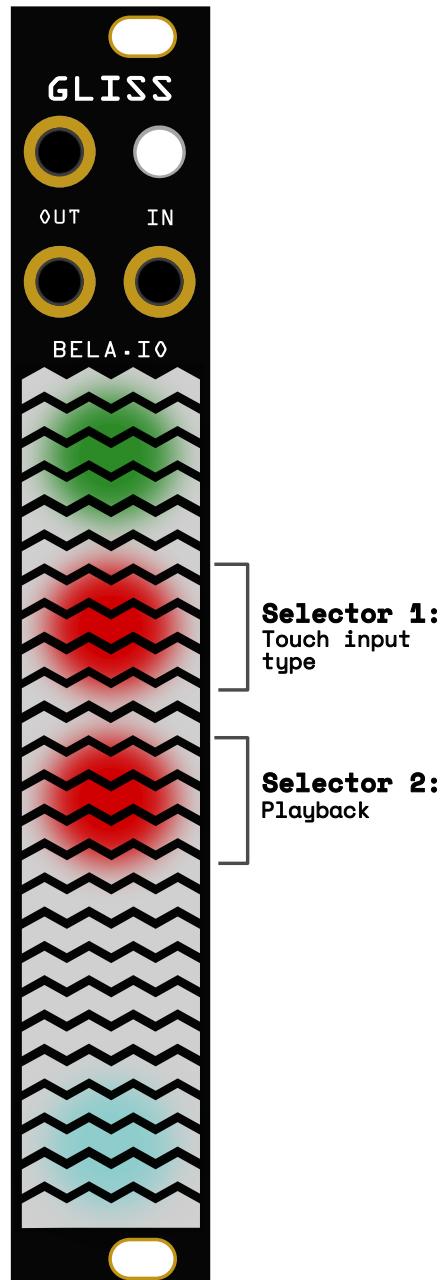
Use the whole Touch Strip to record a gesture that combines both finger position and touch size.

- **Dual Slider**

Each half of the Touch Strip is a slider, and 2 independent finger position gestures are recorded (no touch size).

- **Dual Touch**

Each half of the Touch Strip is a touch-sensitive touch pad, and 2 touch size gestures are recorded (no finger position).



## Selector 2: Playback

There are 5 options for the way your recorded gestures are played back: Loop, Trigger, Clock, Wavetable, and Waveshaper.

### ● Loop

When using Loop playback, you can start recording a gesture up to 75 seconds in length by placing your finger on the Touch Strip. When you lift your finger, Gliss will play back

the recorded gesture indefinitely. Overwrite your gesture at any time by placing your finger on the Touch Strip and recording a new gesture.

Using Loop playback you can trigger playback of gestures - that is, restart the loop from the beginning - by pressing the Button or when a trigger is received in the Input. Any recorded gesture(s) will then return to looping.

When using Dual Slider and Dual Touch input types, the gestures are not looped synchronously - they loop completely independently. If you re-trigger the gestures by pressing the Button, the gestures are triggered from the beginning and then continue to loop asynchronously. Additionally, both gestures can be independently overwritten, which means that updating one gesture has no effect on the other.

You can erase your looping gesture by holding down the Button for 3 seconds. If you're in Dual Slider or Dual Touch input mode, you can choose to erase only 1 gesture by holding your finger on it while you hold down the Button.

### ● Trigger

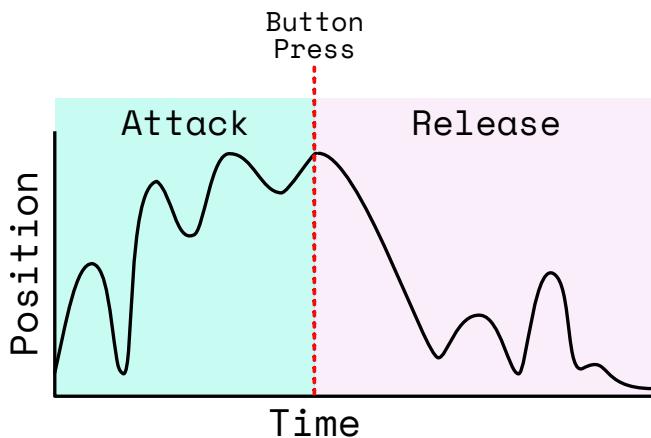
When using Trigger playback, the gesture will play once when the Button is pressed or when a trigger signal is received in the Input. This way, your recorded gesture can act like an envelope with a custom shape.

*A trigger signal is a signal that goes from minimum to maximum voltage, like a momentary switch.*

*A GATE signal, however, is a voltage that goes from minimum voltage to maximum voltage, and stays there until it is turned off. Common ways of creating GATE signals are keyboards, sequencers, and LFOs.*

## PATCHING TIP

***Set the module to Dual Slider and to Trigger Mode to have 2 envelope generators with custom envelope shapes. You can draw in your envelope shapes on the 2 halves of the Touch Strip and then trigger them simultaneously with the Button or trigger signal. This is great for situations in which you want to control a VCA and VCF cutoff simultaneously for some acid bass lines.***



#### **Recording an Attack/Release envelope with the Button**

This diagram shows the process of recording an Attack/Release envelope which can be played back with a GATE signal. Draw in the Attack portion of the envelope, then press the Button to indicate the end of Attack and start of Release, then draw in the Release portion of your envelope.

---

On receiving a trigger signal, the gesture always plays from the beginning, at the speed it was recorded.

#### **Creating a custom Attack/Release Envelope**

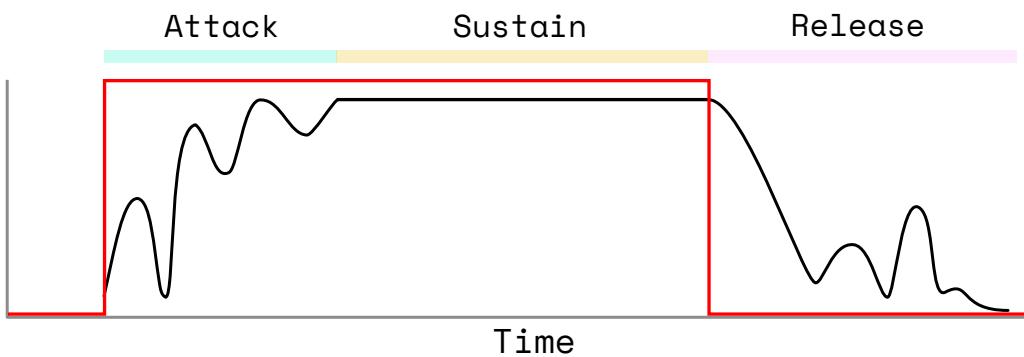
It's possible to create a custom envelope with marked Attack and Release sections. For this kind of envelope you will need a GATE signal into the Input.

To create a custom Attack/Release envelope:

1. Make sure you are have Trigger playback enabled (Setting Selector 2, setting 2).
  2. Draw in the first part of your envelope, and then, with your finger still on the Touch Strip, push the Button to mark the end of the Attack portion. Do not lift your finger.
  3. Draw the Release portion of your envelope. Lift your finger to complete the gesture.
- 

#### **Triggering an Attack/Release envelope with the Button or GATE signal**

When an Attack/Release envelope is triggered, the Attack portion is played and then held at its last value for as long as the Button or GATE signal are held high. When the Button or GATE signal goes low the release portion is played back. In the diagram the Button or GATE is shown in red.



*The divisions of your input clock signal will control the quantisation of your gesture playback. A slow clock signal is great for syncing with bar length, while a faster clock signal will quantise gesture playback to a smaller chunk of time.*

When playing back an Attack/Release envelope, the input signal or Button press will be handled as a GATE signal. When the incoming gate signal is high, the Attack section of the envelope is used. As long as the GATE signal is high, the last value will be held. When the GATE signal returns to low (because, for example, you've stopped pressing a keyboard key), the

Release section of the envelope starts. If the GATE duration is shorter than the duration of the Attack section, Gliss will just play through the entirety of the Attack and Release sections.

The Button can also be used to trigger the playback of Attack/Release envelopes, but note that you need to hold it down to create the sustain, of a GATE signal, instead of tapping it momentarily.

When using Dual Slider or Dual Touch input types (Setting Selector 1), you can set the Attack and Release points separately for each gesture. When Gliss receives a gate signal, both envelopes will be triggered, with the resulting voltage sent out of the respective outputs.

### ● Clock

Clock playback allows you to record gestures and synchronises them with an external clock signal in the Input. When using Clock playback you can record different gestures, one after the other, lifting your finger in between each one.

When in Clock playback, the Button will flash every time it receives a trigger at the Input. While you're recording your gestures, the module will count ticks of this clock signal, and synchronise each gesture length to the nearest ticks.

#### Recording gestures synced to a clock signal

To record a series of gestures:

1. Tap the Button. It will turn red to indicate that recording is armed, and it will start recording on the next rising edge is received at the Input.
2. Record a gesture on the Touch Strip. Note that this gesture can be made up of multiple touch events, meaning you can lift your finger off the sensor as many times as you want while you're recording it.
3. Press the Button again. Recording will stop when the next clock edge is received.

If you're using Dual

*Performing on the Touch Strip while using Clock playback will not overwrite the recorded gesture, unless recording is armed by pressing the Button. This means you can perform over the recorded gestures and know that they will be there and ready to be played back according to the Clock input.*

or Dual Touch input (Setting Selector 1), you can record on both halves of the Touch Strip together or separately. (If one half of the Touch Strip is not touched during a recording, nothing will be recorded and any existing recording will persist.) If recorded together, they will have the same loop duration. If recorded separately they can have separate loop lengths - perfect for polyrhythms.

To erase the current recording, tap the Button rapidly 3 times. You will see the Touch Strip briefly flash red to confirm you have cleared the recording.

If you're using Dual Slider or Dual Touch input type, you can delete only one of the recordings by keeping your finger on that half of the Touch Strip while you perform the 3 rapid Button presses. That half of the Touch Strip will flash red when the recording is cleared.

### **Syncing to sequence length**

Once you have one or more gestures already recorded and looping, you can start recording a new sequence, the length of which will be a multiple of the sequence used as a reference. To do so, press the Button 2 times to arm the recording. Recording will start the next time the reference sequence restarts. When you are done with the recording, tap the Button once. The recording will stop the next time the reference sequence starts.

The length of the sequence depends on the touch input type you're using:

- If you're using Dual Slider or Dual Touch input, the "sequence length" is the duration of the loop on the other half of the sensor - the one that you are not recording on.
- If you're using Single Slider input, the "sequence length" is the duration of the previously recorded gesture, which you are overwriting.

### **Creating loops without a clock**

If you don't have a clock signal available but would still like to create loops with multiple gestures, no problem! With no clock signal present you can still record in multiple gestures. The only difference is that now your loop length is just the amount of time between you pressing the Button to start recording, and pressing the Button again to stop recording.

To record a loop without a clock:

1. Press the Button once to start recording.
2. Record your gesture (you can lift your finger between touches if you want).
3. Press the Button to stop recording. You can record different loop lengths for top and bottom sliders when using Dual Slider touch input.

If you want to create modulation signals that include discrete, stepped values rather than a continuous change, this is the mode for you. When you're recording by touching the Touch Strip and then lifting your finger, you're drawing values that rise and fall between various points. However, when you use Button to trigger playback, this means your finger can come off the Touch Strip, so you can create gestures with values that jump immediately from one to another.

### ● Wavetable

Wavetable varies the playback speed of the recorded gesture at audible frequencies. The pitch or frequency is determined by sending a volt per octave signal into the CV input. This turns Gliss into a voltage-controlled wavetable oscillator: the gesture you record is the waveform, and the CV input will determine how fast that gesture is played back.

The Input voltage is mapped to an oscillator frequency with a 1V/octave scaling. The frequency for a 0V input is 65.4Hz (corresponding to a C2 note). For this playback mode any customised voltage range is ignored.

To get the most from Wavetable we recommend setting the output range to -5V to +5V. Then the outputs can be treated like audio signals so you can connect Gliss to a Eurorack level mixer directly.

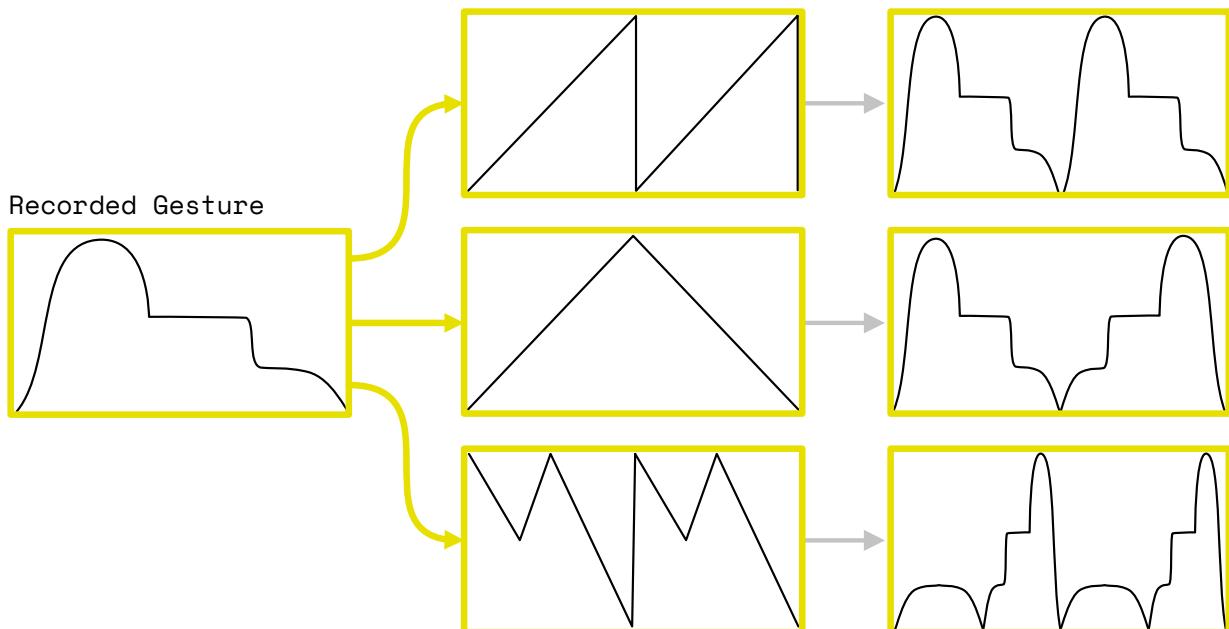
The timbre of the sound depends heavily on the start and end values of your gesture. Making sure your gesture starts and finishes at the same point on the Touch Strip will produce more gentle timbres with fewer overtones or partials. This is because the waveform is starting and finishing in the same place, and therefore avoids sudden jumps in values when it's played back.

If, on the other hand, you want a more complex tone with lots of overtones and partials, then try starting and ending the gesture in two different positions. This

### Playing back gestures with Waveshaper

Using Waveshaper playback lets you play back your gesture in different ways. The bottom of your input range represents the beginning of your gesture, the top of your input range the end.

This diagram shows different waveshapes producing different playbacks. Because the instantaneous voltage of the Input signal is mapped to the minimum voltage and its end to maximum, the way that voltage oscillates determines which part of the gesture is played.



creates square wave-like effects.

Your recorded gesture can be updated at any time—just draw in a new pattern on the Touch Strip.

You can also use Dual Slider or Dual Touch input and get two simultaneous wavetables. The pitch of both will be the same but they will have different timbres depending on the gesture you record.

### ● **Waveshaper**

Waveshaper playback means that you can record a gesture, and then scrub through it using input voltage. In waveshaper playback, the input range is mapped to the gesture length. For instance, with an input range of -5V to +5V, a -5V input will correspond to the middle of the gesture, a 0V input will correspond to the middle of the gesture, and the +5V input will correspond to the end of the gesture. This means that using input voltage you can play different parts of your gesture. See the diagram on the previous page for examples.

## PATCHING TIP

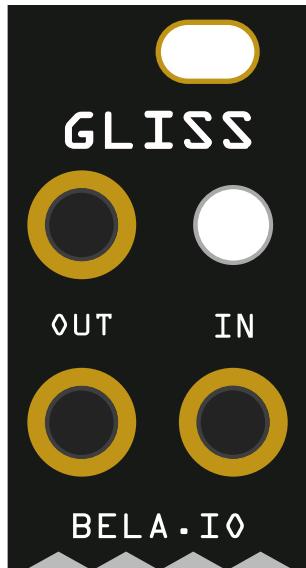
*When using Waveshaper playback you can use an external Attack/Sustain envelope for 1-shot playback of recorded gestures. The envelope's attack time will determine the playback time. Other sloped modulation sources are also good candidates for scanning through a gesture such as smoothly fluctuating random voltages or complex LFOs.*

*Try using the Waveshaper with Dual Slider input. Plug a sine or triangle wave into the input, plug each output to a mixer, and draw waveshapes in the top and bottom sections of the Touch Strip to generate 2 timbrally different oscillator tones.*

## Input and Outputs

**Top Output**  
Single Slider: Finger position  
Dual Slider: Top finger position  
Dual Touch: Top touch size

**Bottom Output**  
Single slider: Touch size  
Dual Slider: Bottom finger position  
Dual Touch: Bottom touch size



**Button**  
Loop: Trigger, hold to erase  
Trigger: Trigger gesture, or GATE  
Clock: Arm recording, press 3 times to erase

**Input**  
Loop: Trigger input signal  
Trigger: Trigger or GATE input  
Clock: Clock input  
Wavetable: CV input (V/octave, ignores input range)  
Waveshaper: CV input

**Mode 3:**

# SIGNAL

*Clip, scale, offset, smooth, and visualise your signals*

In Signal Mode, you can visualise and manipulate incoming signals, significantly enhancing the flexibility of your pre-existing modulation sources. Clip, scale, offset, and smooth CV or audio signals, ready to be passed around your system.

## The Settings Selectors

### Selector 1: Input signal

There are 2 options:

- **Control Voltage (DC coupling)**

Choose this option if your input is a CV signal. The input signal will be visualised as a pointer moving up and down the Touch Strip.

- **Audio Signal (AC coupling)**

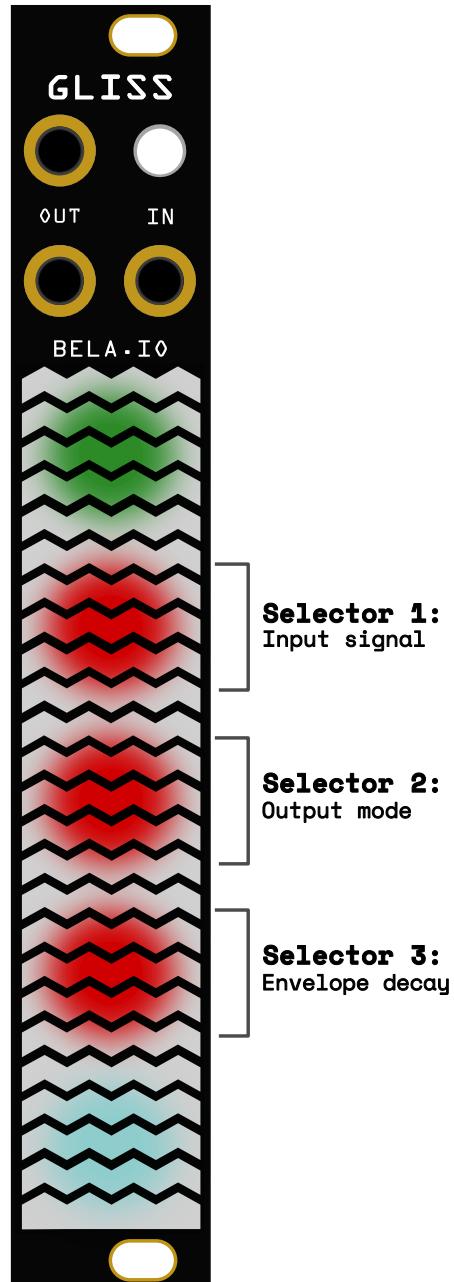
Choose this option if your input is audio signal. This setting visualises your incoming signal like a classic VU meter on a mixing desk.

### Selector 2: Output mode

There are 3 options:

- **Signal/inverted signal**

The Top Output passes the clipped, scaled and shifted version of the input signal. The Bottom Output passes the inverse of the Top Output.



### ● **Signal/Envelope detector**

The Top Output passes the input signal. The Bottom Output passes a scaled ad shifted version of a smoothed envelope of the clipped signal.

### ● **Envelope detector/inverted envelope detector**

The Top Output passes the envelope detector, a smoothed signal that rises and falls with the peaks in your input signal. The Bottom Output passes the inverse of this envelope detector.

## **Selector 3: Envelope decay**

This is a continuous setting. Press the Selector and a single flashing point appears, representing the current value. Slide to adjust.

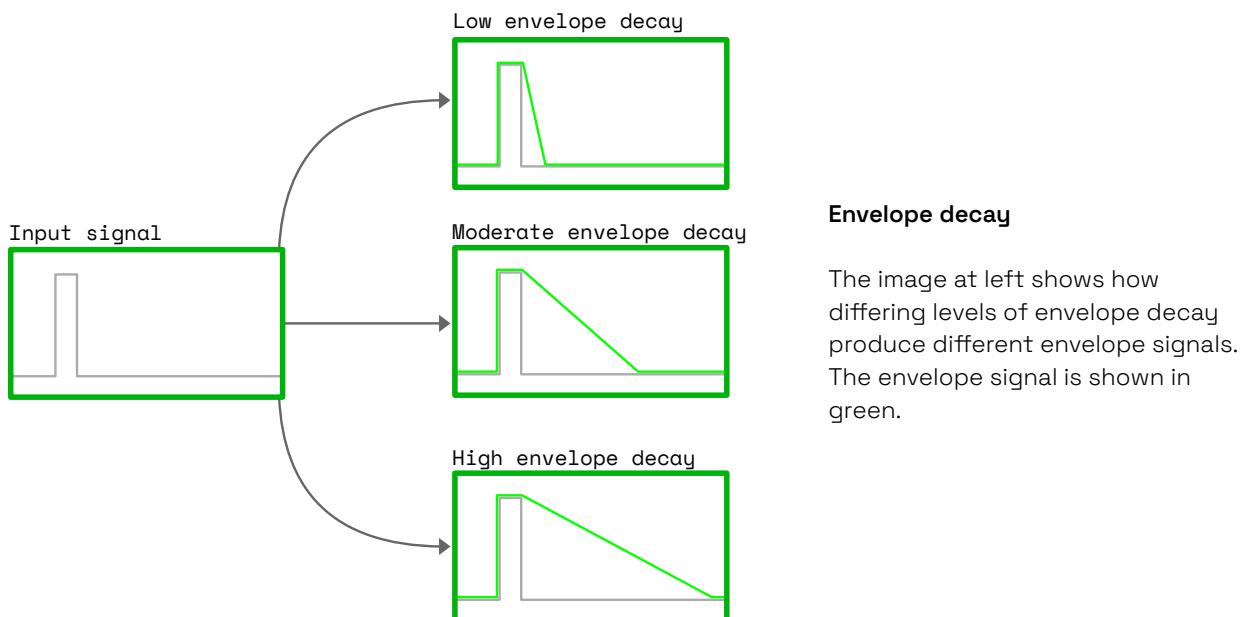
Envelope decay controls the amount of smoothing applied to the decay of your envelope detector output. Below is a diagram with the input signal and the resulting envelope decay, with various levels of smoothing applied.

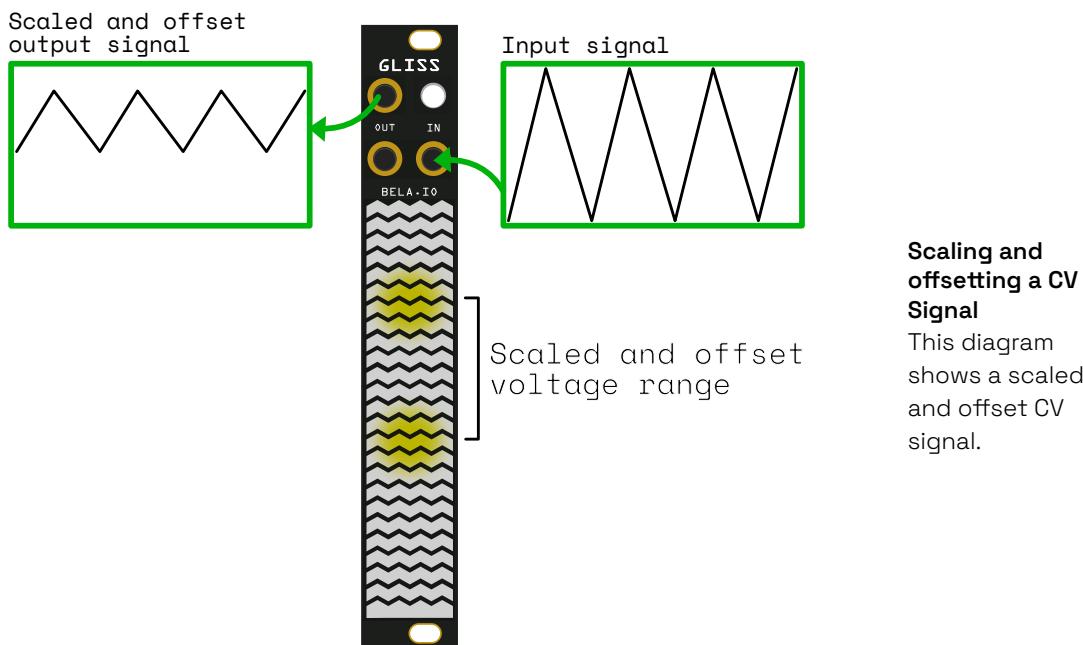
## **Additional capabilities of Signal Mode**

Signal Mode has a number of capabilities for processing signals outside of what you can achieve with the Menu settings. The capabilities available and their effects will depend on whether your input signal is Control Voltage or Audio (Setting Selector 1).

## **CV signal tools**

If you choose CV signal input (Setting Selector 1, Setting 1) you'll have CV signal tools. For best results, set the voltage range for your Input and Outputs for Signal Mode to match that of your incoming devices (you can do this in the Menu by tapping the Voltage Range Selector).





### **Visualise CV signal**

Connect a CV signal to the Input, and that input signal will be visualised on the Touch Strip as a moving point, like a very simple oscilloscope.

### **Scaling and offsetting CV signal**

One of the great utility features of Signal Mode is the ability to scale and offset incoming signals from other modules on-the-fly, which offers interesting performance possibilities.

To scale and offset a CV signal, make sure you're in active Signal Mode (if you're in the Menu, tap the Button to go into Active Mode). Your CV input will be visualised on the Touch Strip.

To scale and offset this input signal, place 2 fingers on the Touch Strip. A gold point will appear under your top finger (representing the maximum scaled voltage level) and a gold point will appear under your bottom finger (representing the minimum voltage level). With 2 fingers on the Touch Strip. Slide these points to scale your signal. You'll see the animated point representing your input moving between your fingertips.

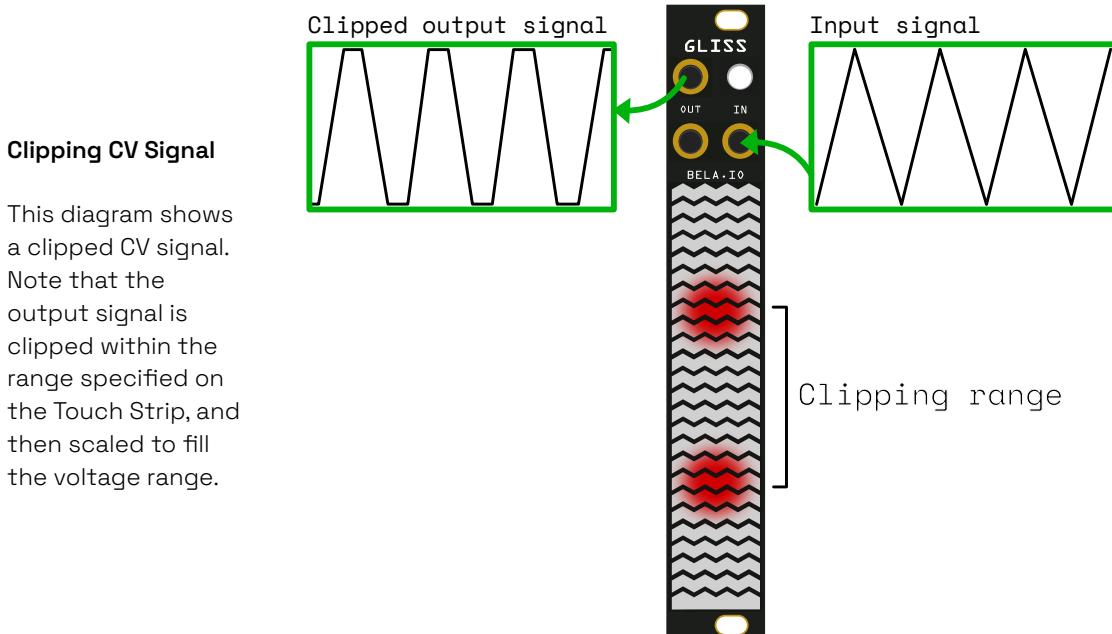
As well as scaling your incoming signal, you can also offset it. With your fingers still on the Touch Strip, drag your scaled voltage range within the full input range you have specified (this is 0-10V by default).

As soon as you lift your fingers off the Touch Strip your chosen values will be stored.

### **Clipping a CV signal**

In active Signal Mode, press the Button to activate clipping. When clipping is enabled, the Button will be red.

With clipping enabled you can set the minimum and maximum clipping points by sliding your fingers to move the red points on the Touch Strip. This selects a portion of your input signal to pass through to the output.



**Clipping CV Signal**  
This diagram shows a clipped CV signal. Note that the output signal is clipped within the range specified on the Touch Strip, and then scaled to fill the voltage range.

The portion of the signal between your fingertips will be rescaled to fill the whole output voltage range (0-10V by default, but customisable from the Signal Mode Menu by tapping the Voltage Range Selector). Anything outside of this range will be hard clipped to the minimum and maximum of your range.

## Audio signal tools

If you have audio input selected (Setting Selector 1), then you have a different set of signal capabilities.

### ***Monitoring audio signals with the VU meter***

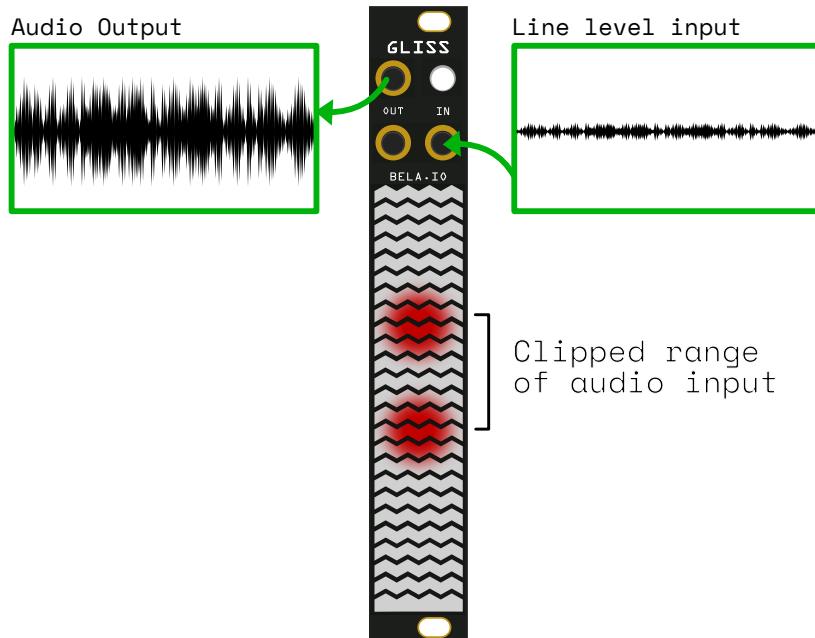
If you select Audio input (Setting Selector 1), you can visualise incoming audio signals with a level meter. The level meter shows you the amplitude behaviour of your audio signal, with a representation common on mixing desks (with the signal visualised as green, orange, and red rising from the bottom of the Touch Strip).

When using an audio input signal, the signal for the visualisation and the input of the envelope detector is obtained from the input signal applying a DC-blocking filter and a 12ms RMS window. The visualisation is displayed on a logarithmic scale, as on a level meter.

If you have selected one of the envelope detector outputs (Setting Selector 2), you will also see an animation of the smoothed output animated on top of the VU meter. This will look like a peak on your audio signal, which decays more slowly than the audio signal itself. The envelope detector will be particularly visible for input signal with large transients (sounds that go from silent to loud and back to silent quickly, like a drum hit).

### ***Scaling and offsetting audio signal***

The same logic of scaling and offsetting can be applied to your audio signal as described above for CV. In Active Mode, place both fingers on the Touch Strip. A gold point will appear under your top finger and a gold point under your bottom finger,



### Using signal clipping as amplification

This diagram shows how clipping can be used as a signal amplifier for weaker signals in your system by setting the clipping points to the upper and lower limits of the visible signal on the VU meter.

representing the scaled amplitude range of your incoming signal.

To offset your incoming audio signal, slide your 2 fingers up or down the Touch Strip to shift the overall range anywhere between your output's minimum and maximum (this is 0-10V by default, but you can customise this for Signal Mode).

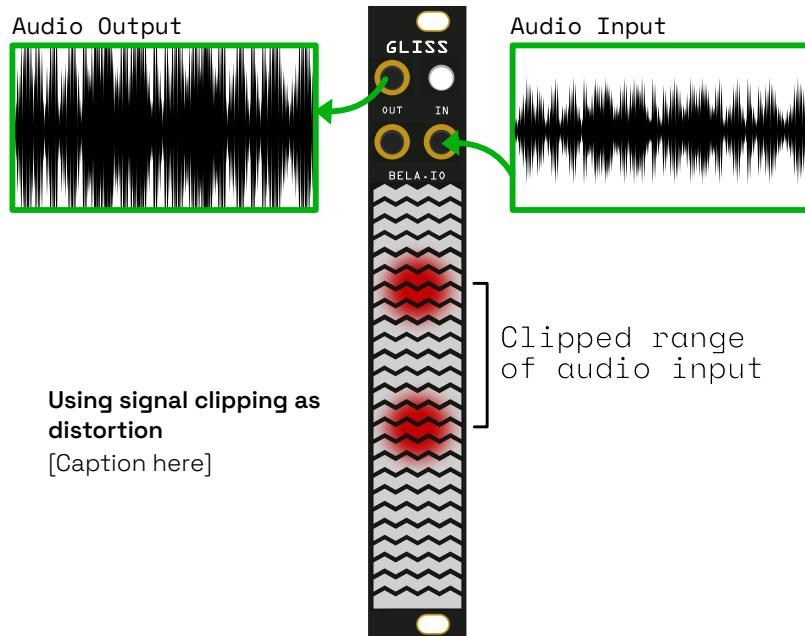
### **Clipping an audio signal**

Clipping your incoming audio signal can create all kinds of interesting-sounding distortion effects.

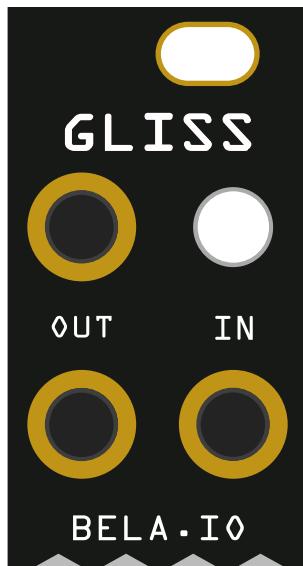
From the active Signal Mode (not in the Menu), tap the Button to begin clipping. While clipping the Button will be red. You will now see a green point that visualises your incoming audio signal.

The red points at the top and bottom of the Touch Strip represent your 2 clipping thresholds. Adjusting these allows you to limit the positive and negative parts of the audio signal independently. This creates a hard clipping distortion, adding interesting harmonics to your original audio signal. Changing the position of the clipping points on the Touch Strip changes the character of the distortion and the harmonics which make it through to your output audio signal.

*The clipping functionality can also be used as a signal amplifier for weaker signals in your system by setting the clipping points to the upper and lower limits of the visible signal on the VU meter.*



## Input and Outputs



**Top Output**  
 Signal/Signal: Processed output  
 Signal/ED: Processed output  
 ED/ED: Smoothed envelope

**Bottom Output**  
 Signal/Signal: Inverted input  
 Signal/ED: Smoothed envelope  
 ED/ED: Inverted envelope

**Button**  
 Enter/exit input clipping

**Input**  
 Signal to be processed

**Mode 4:**

# NOTES

*A set of 5 tunable notes, playable as a keyboard or a step sequencer.*

Notes Mode turns the Touch Strip into a set of tuned notes. These notes can be played like a keyboard that you play with your fingers (with expressive glissando and vibrato), or like a sequencer where the notes are triggered one at a time by an incoming clock signal (with the behaviour of each step highly customisable).

Notes Mode has more complex customisation that isn't available in other Modes, so you can set up the available notes and their behaviour just the way you want it. If you want your oscillators to track quantised pitches generated in Notes Mode, be sure to connect Gliss's Top Output to a VCO's V/oct input.

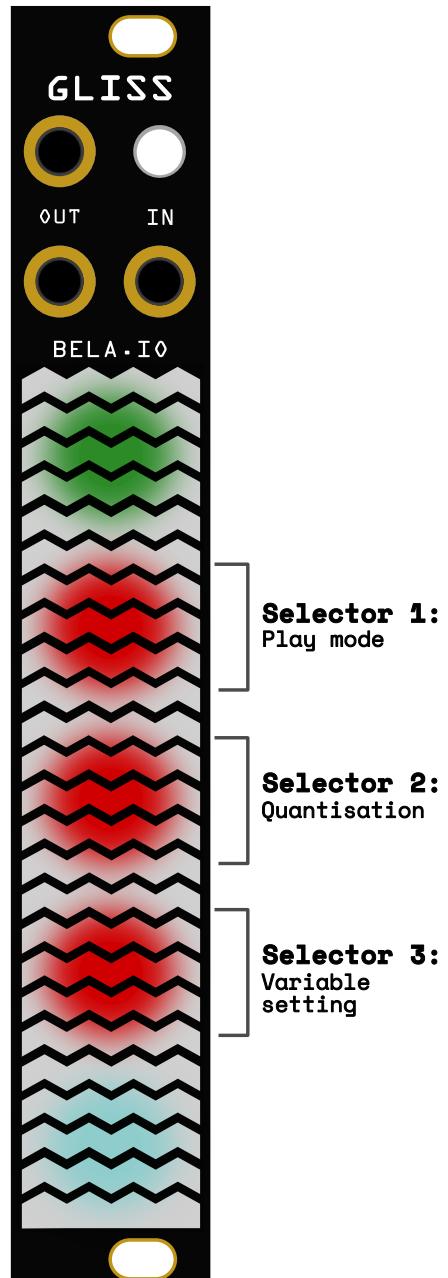
## The Settings Selectors

### Selector 1: Play mode

There are 2 options:

- **Keyboard**

In Keyboard play mode, the notes on the Touch Strip are playable by touch and have expressive capabilities: Press a note and wiggle your finger for vibrato, and slide between notes with glissando.



### ● **Sequencer**

When you're playing the notes as a Sequencer, the notes are triggered in sequence by an incoming clock signal. Pressing a step will reset the position of the sequencer to that note.

## **Selector 2: Quantisation**

This setting refers to quantisation while tuning the notes. There are 2 options:

### ● **Quantisation OFF**

With quantisation OFF, the pitches are not stepped, allowing you to achieve voltage levels that do not conform to 12-tone equal temperament.

### ● **Quantisation ON**

With quantisation ON, the pitches are stepped to help you achieve a precise voltage level while tuning manually (see the Tuning Manually section below for details.)

## **Selector 3: Variable setting**

This is a continuous setting. Press the Selector and a single flashing point appears, representing the current value. Slide to adjust.

The variable this setting controls depends on whether you have selected Keyboard or Sequencer playback (Setting Selector 1). Note that the variable value is shared between the Keyboard and Sequencer settings.

### **When using Keyboard play mode**

If you choose Keyboard play mode (Setting Selector 1), this Selector sets the **vibrato depth** (the range of frequency variation when you wiggle your finger on a note while activating it). Slide the point down for minimum vibrato and up for maximum vibrato.

### **When using Sequencer play mode**

If you choose Sequencer play mode (Setting Selector 1), this selector controls the amount of **glide** between each step in the sequence.

## **Tuning the notes**

Notes Mode comes configured with 5 notes tuned to a pentatonic scale, but the tuning of the notes is fully customisable. Tuning the notes means you can set the precise voltage level that's sent out of the Top Output when that note is played, whether your play mode is Keyboard or Sequencer.

To tune the notes, make sure you're in Active Mode (not in the Menu). Press the Button rapidly 3 times. The notes on the Touch Strip begin to pulse when they're ready to be tuned, and the Button turns solid red.

These notes can be tuned in 2 ways: manually, or by CV input.

The total voltage range available for tuning is the Top Output voltage range for Notes Mode. This comes configured to 0V to +10V, but the full range is -5V to +10V (and is customisable).

the note's tuning.

If you're tuning manually it can be difficult to achieve a precise voltage level. To help, you can enable Quantisation (Setting Selector 2), which divides your range into 12-TET semitones. Note that if the output range is large and trying to tune a voltage very accurately, the voltage stored when you release your finger might be slightly different from the one you were aiming for, because Gliss responds to very small changes in finger position. To prevent this, press the Button while your finger is still on the Touch Strip. This will store the exact voltage that you were holding, and ensures no tiny position changes take place when you release your finger.

When you're finished tuning, press the Button once to return to the Active Mode.

## CV input tuning

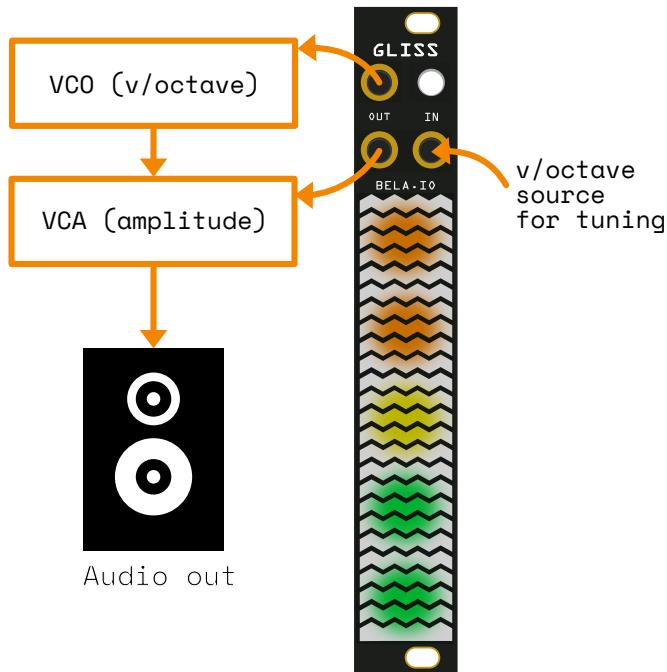
Most people find tuning with CV input more straightforward, because it removes the guesswork of selecting a precise value for each note.

To tune the notes with CV input, connect a volt per octave CV (from a keyboard, sequencer or another module) into the Input. Play a note from the connected device, and press the note on the Touch Strip that you want to tune to that voltage level.

When you're finished, press the Button once to return to the Active Mode.

## TUNING TIP

*Don't have a volt per octave source around, and find it difficult to tune manually? You can reduce the range of available notes by changing the voltage range for the Top Output. This is useful if you want to limit your possible notes to, say, 2 octaves, which requires a fairly narrow output voltage range. Listen to your oscillator while setting your maximum and minimum voltage output levels in order to hear your potential range of notes.*

**Keyboard patch example**

This diagram shows the Top Output, which is v/octave pitch, to the appropriate input of our VCO. The Bottom Output gives us our touch size, which here we are using to control amplitude on our VCA. Touch size is variable, so we can perform a large range of different dynamics by adjusting how hard we press on the Touch Strip. The output from the VCO is passed into the input of the VCA, and the resulting sound is passed to the speaker.

## Keyboard configuration

Using the notes as a Keyboard (Setting Selector 1) means that you can trigger the notes by tapping them on the Touch Strip. The tuned voltage of the active note will be sent out the Top Output, and the touch size of your finger will be sent out the Bottom Output.

### Expressive control

When you play the notes as a Keyboard you also have some expressive features:

1. Add vibrato holding down on a note and wiggling your finger (you set the vibrato range in Setting Selector 3).
2. Play the keyboard by tapping each note, or slide continuously between notes to create glissando.

#### **A note on expressive vibrato and glissando**

You can tune the notes of your keyboard to any pitches you like using the procedure described in the current section, but if you'd like to use the expressive vibrato and glide features we recommend that the pitches are arranged in ascending order from the bottom of the Touch Strip to the top.

Gliss assumes that pitches are arranged in ascending order up the Touch Strip. For example, this means that when using vibrato, moving your finger up the Touch Strip bends the pitch up, and moving your finger down bends the pitch down. Therefore if your notes are not ascending, or if the vibrato depth exceeds the spacing between two adjacent notes, using vibrato/glissando may produce some unexpected behaviours.

## Customise the number of keys

By default Gliss is configured for a 5-note keyboard, but you can choose anywhere between 1 and 5 notes.

To change the number of notes in your keyboard, make sure you're in the Active Mode (not in the Menu). Press the Button twice. The notes will begin to flash, and the Button will pulse red.

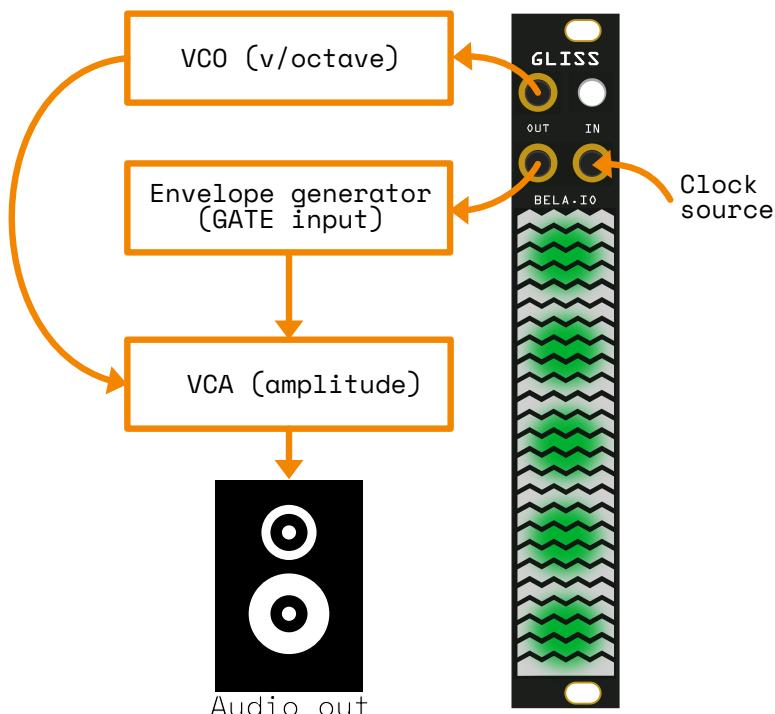
You can now disable or enable the notes by tapping them. Only the selected notes—with their associated voltage levels—will now be in your keyboard.

When you've selected your desired notes, press the Button once to confirm. You will see that the notes are laid out to use the full length of the Touch Strip. Each of these notes will have the tuning that they have already been assigned (though this is configurable by entering the Tuning mode as described above).

*Decreasing the number of keys can make the keyboard easier to play, and provides more space for vibrato and sliding between notes.*

## Sequencer configuration

Using the notes as a Sequencer (Setting Selector 1) means each of the notes becomes a step in a sequencer, with each step triggered by a signal connected to the Input. The Top Output sends the voltage associated with the current active step, while the Bottom Output sends a trigger out for each active step. The trigger out is +10V if the current step is the first in the sequence, otherwise the trigger is +5V. In addition to customising the glide between the steps (using Setting Selector 3), you can also customise how each step behaves.



**Sequencer patch example**

This diagram shows using the Bottom Output to trigger an envelope generator, which is then used to control the amplitude of a VCA. As we receive a clock signal we advance a step and simultaneously trigger the envelope, which controls the amplitude of the pitched note we hear.

## Choose the next active step

While in Active Mode using the Sequencer, you can choose which note is played next on-the-fly by tapping it. That step will be played next, and the sequence will continue looping from that note.

## Configure the steps

Each of the 5 steps is individually configurable.

Make sure you're in the Active Mode (and not in the Menu). You will see the steps on the Touch Strip. Press the Button twice. The steps will now pulse.

Each step can be placed in one of 4 states, and you can cycle through these states by tapping the step. The available states are:

### ● **Active (default)**

This note will be played when triggered.

### ● **Hold**

The previous note will be held until the next trigger, and no trigger will be sent out the Bottom Output.

### ● **Mute**

This disables the step. Output is OV, and no trigger is sent from the Bottom Output.

### ● **Skip (off)**

This removes the step from the sequencer.

## Mute vs Skip

The difference between Mute and Skip states is subtle, but important. In Mute, that note will output OV when it's active, resulting in a pause in the sequence. However, if that note is set to Skip it is removed from the sequence, reducing the overall length.

Here's an example: If one note of 5 is set to Mute, the sequence is still 5 steps long, and the output will be OV when that muted note is active. However, if that step is set to Skip, the note will be removed from the sequence, and the sequence length will be reduced from 5 steps to 4.

## Tuning while using Sequencer play mode

It is also possible to retune the steps on-the-fly while your sequence is playing in Sequencer play mode. Press the Button 3 times and follow the instructions listed above in the "Tuning the notes" section. While tuning in Sequencer mode, only Manual Tuning is available, but you can adjust the voltage associated with each step while the sequence is playing.

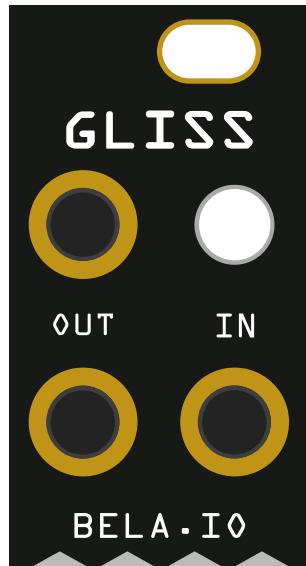
## Input and Outputs

### Top Output

Keyboard: Pitch of current note  
Sequencer: Pitch of current note

### Bottom Output

Keyboard: Touch size  
Sequencer: Trigger signal sent when an active note is played



### Button

Enter/exit Tuning mode

### Input

Tuning: Input voltage to be stored as note  
Sequencer: Clock signal to trigger playback

# OTHER FUNCTIONS

## Calibration Mode

All Gliss modules are calibrated for optimal responsiveness before we ship them, but every setup is different. If for some reason you find your Gliss module needs calibration, follow this method.

Note that calibration must be done with Gliss installed in your rack.

### Step 1: Enter Calibration Mode

Go to the Menu in any Mode (hold down the Button, tap the Touch Strip with 2 fingers, release the Button).

Press and hold the green Mode Selector for 2 seconds. You will be taken to Calibration Mode.

### Step 2: Evaluate voltage levels

When you enter Calibration Mode you'll see an orange point on the Touch Strip moving up between 4 fixed positions. These positions indicate the voltage levels of -5V, 0V, +5V, and +10V. These voltages are sent out of the Top Output, so you can check those voltage levels if you want to confirm them.

You can also check the accuracy of Gliss's voltage levels by moving your finger up the Touch Strip and evaluating the output. As you move your finger Gliss will output voltages from -5V to +10V, in 1V steps.

### Step 3: Disconnect any cables

Make sure that your Gliss module is installed in your rack, connected to the rack's power supply, and everything is unplugged from the Input and Outputs.

### Step 4: Perform calibration

Press the Button to start calibration. When the middle of the Touch Strip starts blinking orange, connect a cable between the Input and the Top Output. The middle of the Touch Strip will now pulse orange as Gliss performs its calibration.

When calibration is complete, the Touch Strip will again show a single orange point

moving up the 4 fixed positions, indicating voltages of -5V, 0V, +5V, and +10V on the Top Output. You can evaluate the CV from the Top Output to make sure it's what you expect.

## Step 5: Save calibration

To save the calibration, hold down the Button and tap the Touch Strip with 2 fingers. Tap the green Mode Selector at the top of the Touch Strip, and you'll return to the Menu for Control Mode. Exit the Menu by pressing the Button, and calibration will be saved.

Note: If you shut down or power off your Gliss module during calibration, your settings won't be saved.

You can recalibrate Gliss at any time by repeating this process.

## Reset all menu settings

This will reset all settings on your module, and restore it to the way it was configured when it was shipped to you, and resets calibration.

To reset Gliss:

1. Hold the Button, and touch the Touch Strip with 5 fingers. The Button will start blinking red and green. Hold for 10 seconds. (This is deliberately awkward — you don't want to be able to erase all your customisations by mistake!) The Touch Strip will start blinking gold in the top half, and red in the bottom half.
2. Release the Button, but keep 2 fingers on the Touch Strip, one on the top half, and one on the bottom half.
3. The Touch Strip will light up from the centre to the bottom and top. When the whole Touch Strip is green, Gliss is reset.

After resetting your settings, Gliss will be in Factory Test Mode.

## Factory Test Mode

This is for debugging your module in case of unexpected behaviour. Factory Test Mode goes through a series of phases that allow you to test every part of your module, and make sure it's all working.

You automatically enter Factory Test Mode after calibration, but you can also enter Factory Test Mode at any time by holding the Button and touching the Touch Strip with 5 fingers. The Button will begin blinking red and green. Release your fingers and the Button, and press the Button again to enter Factory Test Mode.

When you first enter Factory Test Mode, the entire Touch Strip will be illuminated and flashing between red and gold. The Button will flash between green and red. To begin the testing process, press the Button.

## Phase 1: Testing of the LEDs under the faceplate

One LED at a time turns gold. Verify that there are no gaps in the line of LEDs, and all LEDs are the same colour.

Press the Button to continue.

## Phase 2: Testing of the capacitive pads on the Touch Strip

All Touch Strip LEDs start yellow. Slide your finger on the Touch Strip until all LEDs go off. If all Touch Strip LEDs go off and the Button LED goes green, this test is passed.

Unplug all jacks (if any are connected), and press the Button to continue.

### *If some pads don't seem to be working*

If you run your finger up the Touch Strip and not all the lights go off, the problem is usually with the connecting pins between the module and the faceplate.

Gliss's faceplate is attached to the module via 2 rows of pins and headers. Pins that most commonly cause disruption with the pads are those at the very top and very bottom of the Touch Strip.

If you experience this, remove Gliss from your rack and disconnect from power. Gently press each row of pins to make sure they're making full contact, paying special attention to the pins closest to each end of the Touch Strip. Reinstall Gliss.

## Phase 3: Testing of the Input and Outputs

When the Touch Strip blinks orange, plug a cable between the Input and the Top Output. The Touch Strip will glow orange for a couple of seconds as it calibrates the Input and Outputs.

Press the Button to continue.

## Phase 4: Confirm the test

If all tests are passed, the Touch Strip will glow green. A red Touch Strip indicates a failed test.

To begin the test again, press the Button twice. The Touch Strip and Button should pulse between 2 colour states. Press the Button once more to begin the test process.

To return to using Gliss, access the Menu (hold the Button, tap the Touch Strip with 2 fingers, and release the Button). Tap the green Mode Selector to tap to the next Mode.

This saves your calibration settings, and Gliss is ready to use!

## Hacking and expanding Gliss

Gliss, along with all Bela products, is open source hardware. This means that the hardware designs, as well as the firmware and software that runs on it, are available

online for you to hack, remix, and extend.

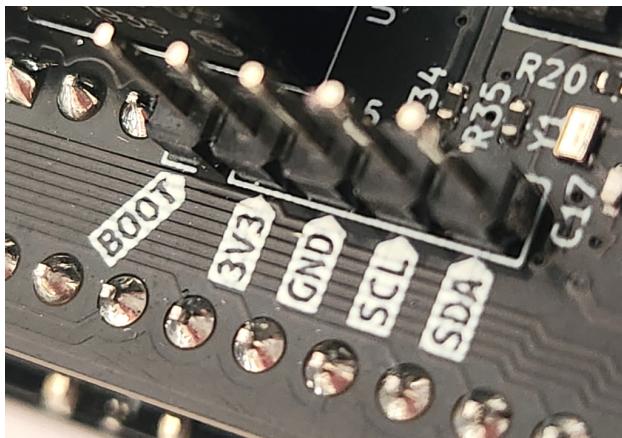
Find all the Gliss hardware and firmware files here:

<http://github.com/belaPlatform/Gliss>

You can also find all the Bela repos (for all Bela products, including Trill sensors) on Github: <http://github.com/belaPlatform/>

Please note: Adding your own hardware or loading your own firmware will void your warranty, as we can only guarantee the features and implementation that we have tested.

## Experimental feature: I2C



Gliss has an I2C port on its underside, which has the potential for chaining multiple modules together.

We may release a public firmware update to support this, but at the moment it's unsupported. However, developers who want to explore the potential of chaining multiple Gliss modules together are welcome to explore its use.

## Licensing

Gliss's hardware designs are available under a Creative Commons Sharealike license (CC BY-SA 4.0), and firmware is under GPL 3.0. This means they can be freely reused and remixed with attribution, provided modifications remain open source.

Gliss firmware is licensed under GNU Public License, meaning that you can freely use, remix, change and extend the code, but you are obligated to make the modified source code available alongside any binaries (flashed, or as files) that you release.

## Commercial licenses

If you're interested in using Gliss technology in a commercial project without making your changes open source, merging your changes to our repository, and/or providing attribution, this requires a commercial license. We believe in offering paid commercial licenses that are tailored to fit your project and its scope, and we are always open to proposals for industry consultation projects for integrating Bela technology into commercial products. Drop us a line at [info@bela.io](mailto:info@bela.io), we are always happy to chat!

## Updating Gliss firmware

From time to time we may release experimental features as new firmware versions. You can update your firmware with these versions without voiding your warranty.

Go to <http://learn.bela.io/gliss> for instructions on how to update your board to the latest firmware.

## Get Support

If you run into trouble with Gliss (or any Bela products), the best place to get help is to visit the Bela Forum at <http://forum.bela.io>. Here you'll find expert advice from the Bela team, as well as great information from our worldwide community of artists, makers, musicians, and hackers.

## Show us!

We are always excited to see what you're working on, and we love featuring great projects! Check out <http://blog.bela.io> for a collection of the amazing things creative makers are doing. If you have a great project that uses Gliss (or any other Bela product), please drop a line to info@bela.io and tell us about it! Please also include links to any photos and videos that you have. Use the subject line "Blog Submission".

# WARRANTY & COMPLIANCE

## 3-year warranty

All assembled Gliss modules come with an extended warranty of 3 years from the date of purchase. This warranty covers the failure or malfunction of the device within this period which is due to our manufacturing processes or the components used. The warranty covers return shipping to the customer (worldwide), but not the shipping to have the device returned to Bela.io.

The warranty is void if the device has failed due to the customer's negligence including (but not limited to) connecting the device to an inappropriate power supply, damage due to mishandling, and/or damage due to extreme conditions (including but not limited to temperature, humidity, moisture, or dust).

For warranty claims please email with [info@bela.io](mailto:info@bela.io) with proof of purchase and we'll take it from there.

## A note for Gliss hackers

Hacking the device, for example by adding additional hardware to the I2C port or editing the firmware on the device, will void the warranty. This is because we can't be responsible for code or use cases that we haven't tested and released ourselves.

However, we want to support people expanding Gliss and hacking its component parts! If you run into trouble we will be happy to advise you of the best course of action. Please post on the Bela Forum at <http://forum.bela.io>.

## Compliance information

This product complies with the relevant provisions of the RoHS Directive for the European Union. In common with the Waste from Electrical and Electronic Equipment (WEEE) directive, this product should not be disposed of as household waste.

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility.



Gliss is created, designed, and produced by the team at Bela.io. Visit <http://bela.io> to discover the Bela systems for creating beautiful interaction with sensors and sound, as well as the Trill family of touch sensors that drive Gliss's touch interaction.

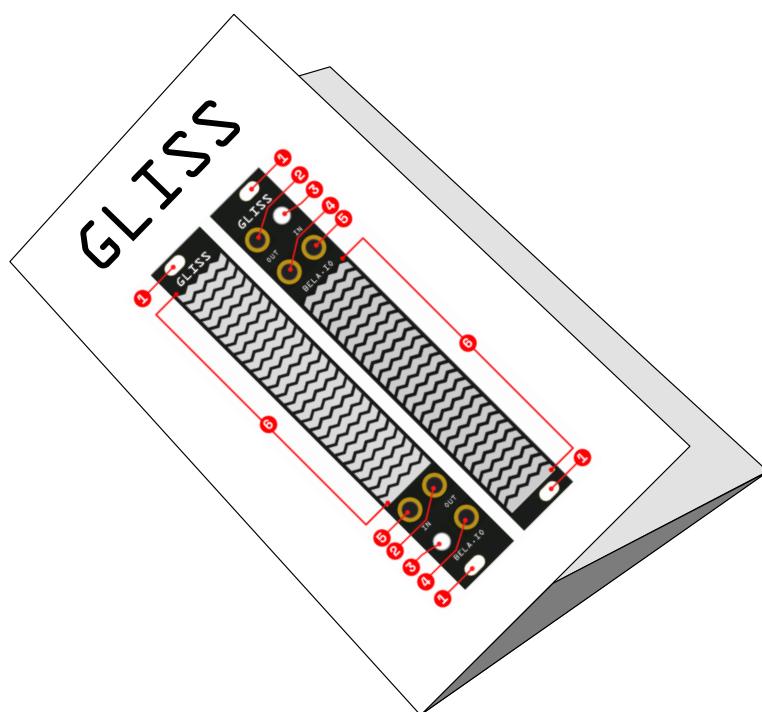


# CHEAT SHEET

The following 2 pages are a printable Cheat Sheet for quick reference while you're using Gliss.

To create your Gliss Cheat Sheet:

1. Print the pages double-sided, and in the same orientation
2. Crease along the fold lines on the back
3. Fold like a pamphlet, with the Gliss diagram on the cover



## Mode 1: CONTROL

Control gestures in real time, using your finger position, touch size, or both.

### SELECTOR 1: CONTROL TYPE

- Single Slider
- Dual Slider
- Dual Touch

### SELECTOR 2: LATCHING

- Unlatched
- Latched
- Latch Position

## Mode 2: RECORD

Record gestures up to 60 seconds long. Play them back in various ways, as LFOs or envelopes.

### SELECTOR 1: TOUCH INPUT

- Single Slider
- Dual Slider
- Dual Touch

### SELECTOR 2: PLAYBACK

- Loop
- Trigger
- Clock
- Wavetable
- Waveshaper

## Mode 3: SIGNAL

Scale, smooth, clip and visualise your incoming signals.

### SELECTOR 1: INPUT SIGNAL

- Control Voltage (DC Coupled)
- Audio Signal (AC Coupled)

### SELECTOR 2: OUTPUT TYPE

- Signal/inverted signal
- Signal/envelope
- Envelope/inverted envelope

### SELECTOR 3: ENVELOPE DECAY

- Continuous; tap and slide point to adjust.

## Mode 4: NOTES

5 tunable notes to play as a keyboard or step sequencer.

### SELECTOR 1: PLAY TYPE

- Keyboard
- Sequencer

### SELECTOR 2: QUANTISATION

- On
- Off

### SELECTOR 3: VARIABLE

- Continuous; tap and slide point to adjust.

In KEYBOARD: Vibrato depth  
In SEQUENCER: Glide

# Global Settings

The Global Settings menu is for adjusting general behaviours of Gliss.

### To enter Global Settings:

- Hold the Button
- Tap the Touch Strip with 3 fingers
- Release the Button



### TOUCH SENSITIVITY

Continuous; tap then slide pointer to adjust.

### LED BRIGHTNESS

Continuous; tap then slide pointer to adjust.

### MENU ANIMATION

Hold to toggle on/off

### MODULE ORIENTATION

After changing your faceplate, hold and drag to the bottom to reorient your module.

# The Mode Menu

The Mode Menu - or Menu - is where you can customise the Mode you're in, and move between Modes.

## To enter the Menu:

1. Hold the Button
2. Tap the Touch Strip with 2 fingers
3. Release the Button



**MODE SELECTOR**  
Tap to move to the next Mode.

**SETTINGS SELECTORS**  
Up to 3. Each represents a group of related settings. Tap to step through.

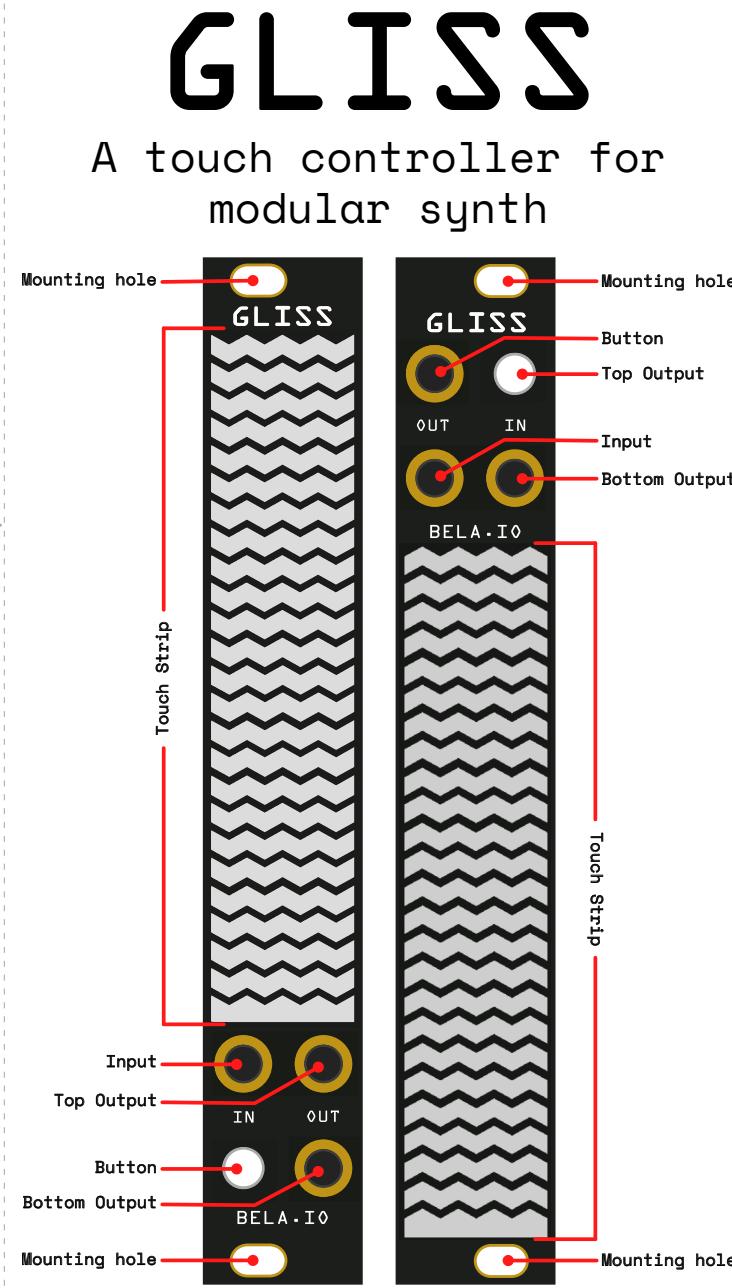
**VOLTAGE RANGE**  
Tap to customise the voltage range of the Input and Outputs for the current Mode.

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- 1 Mounting Hole
- 2 Top Output
- 3 Button
- 4 Bottom Output
- 5 Input
- 6 Touch Strip

\* Gliss comes with 2 faceplates, so you can choose the orientation that's right for you.