Sigmoid's Affecter

Audio Signal Modification Unit
User Manual And Technical Reference

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James Chaffinch

James Chaffinch, CEO

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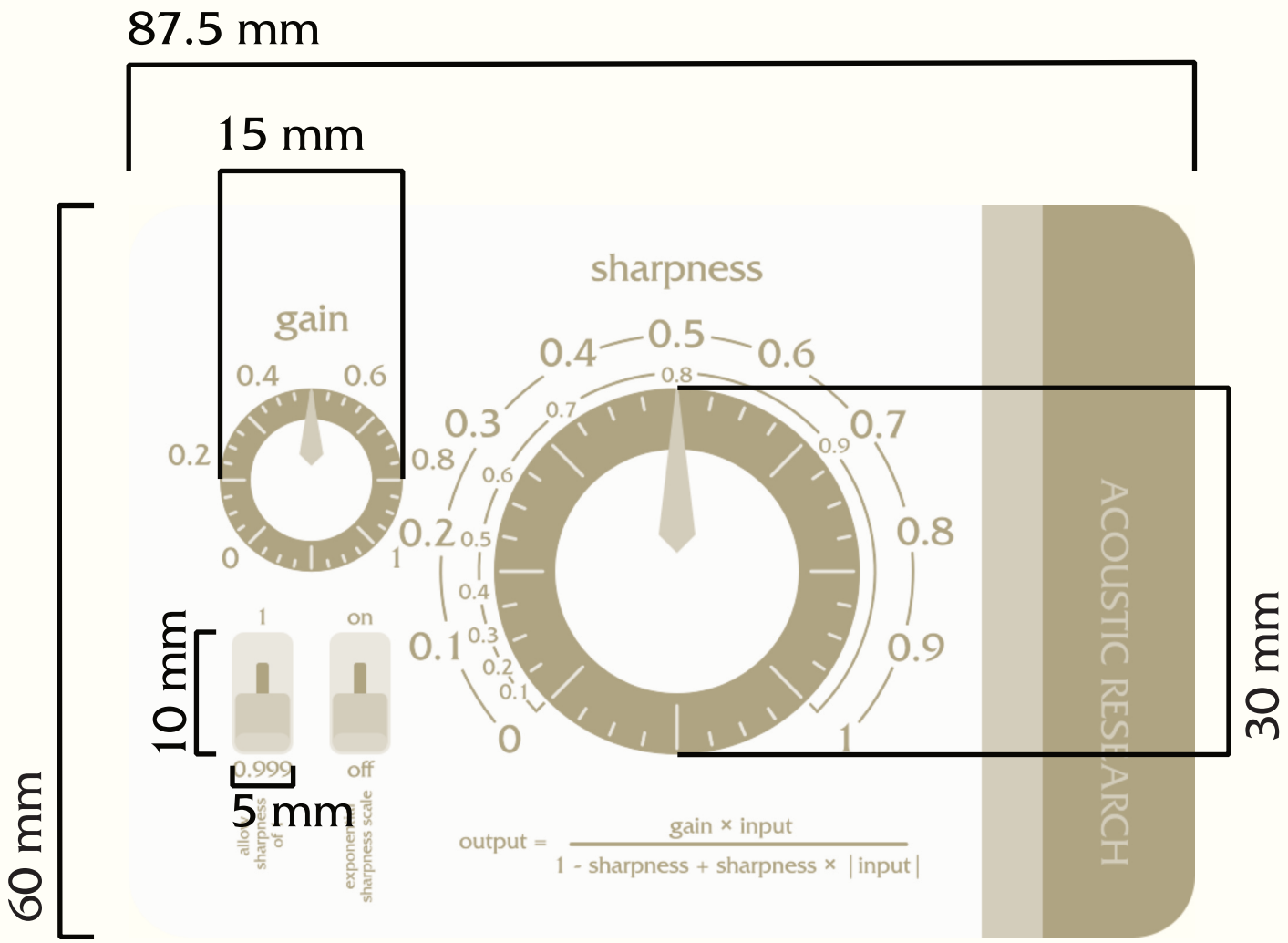
 Document version 1.45

Contents



Description

The Sigmoids Affecter unit is an audio signal modification device which implements a modified version of the sigmoid function.

$$y = \frac{x}{1 - |x|}$$

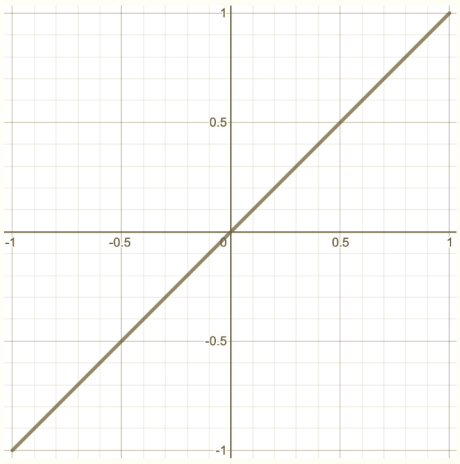
Modifications are made to this equation which enable the shape of the resulting curve to be adjusted, as well as the resulting output to be scaled.

$$\text{output} = \frac{\text{gain} \times \text{input}}{1 - \text{sharpness} + \text{sharpness} \times |\text{input}|}$$

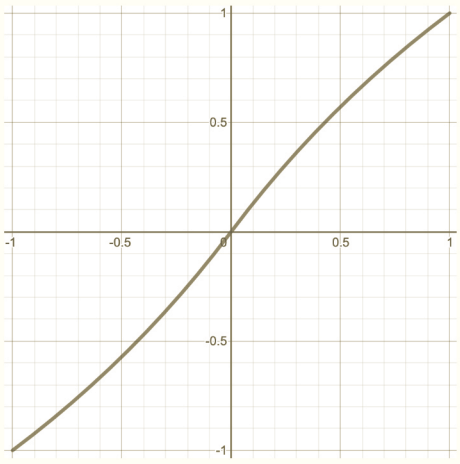
The effect of this equation, is to amplify the affect of signal change. With a higher ‘sharpness’ value, lower input signal strengths will result in stronger output signals. While higher strength input signals will also result in strong output signals; the relative difference will be lesser. See the figures on the facing page for example ‘sharpness’ values and their outputs.

Note: with a ‘sharpness’ value of 1, any input signal will result in an output signal with the maximum signal strength. As such one should take great care with this setting, which is only accessible after switching the ‘Sharpness Adjust Dial Modifier A’ switch to the ‘on’ position.

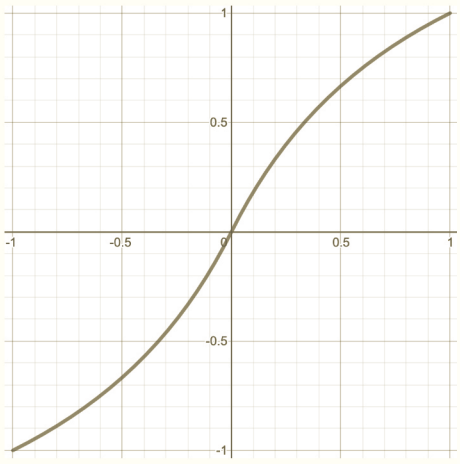
Demonstration Of The Result Of Adjustment Of The Sharpness Value Over A Range Of Values



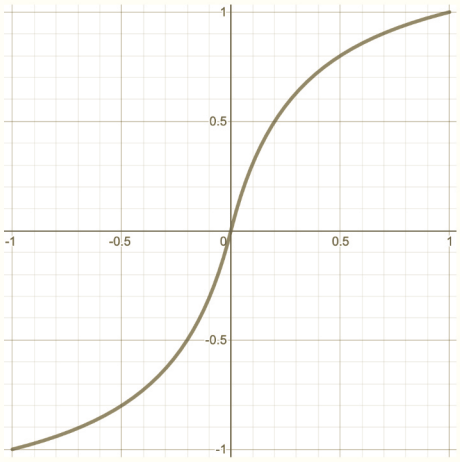
Sharpness: 0.0



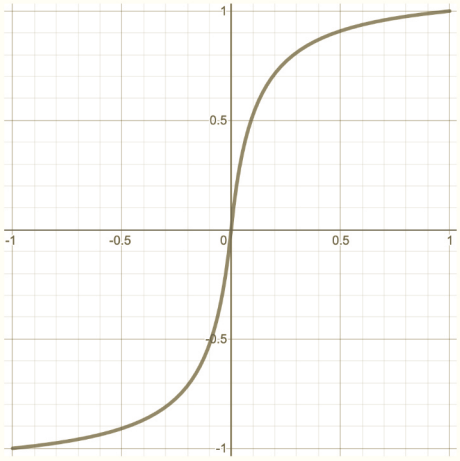
Sharpness: 0.25



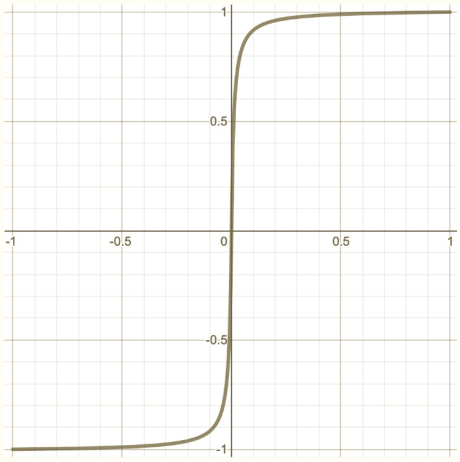
Sharpness: 0.5



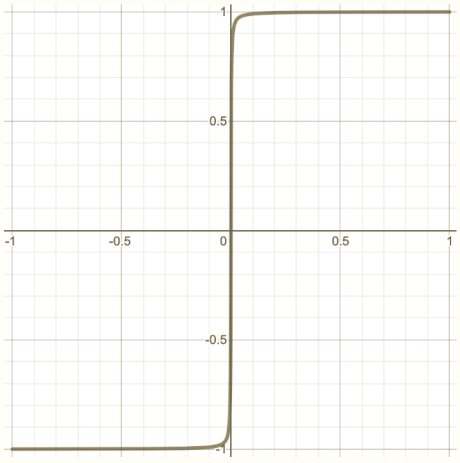
Sharpness: 0.75



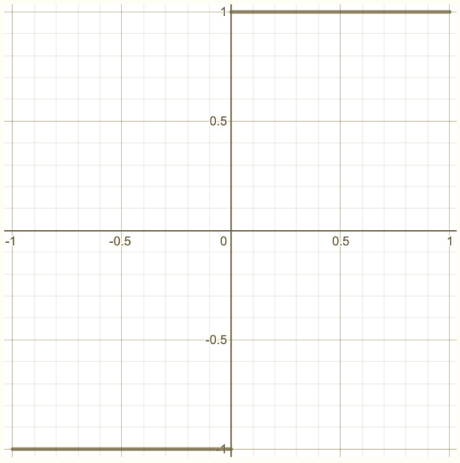
Sharpness: 0.9



Sharpness: 0.99

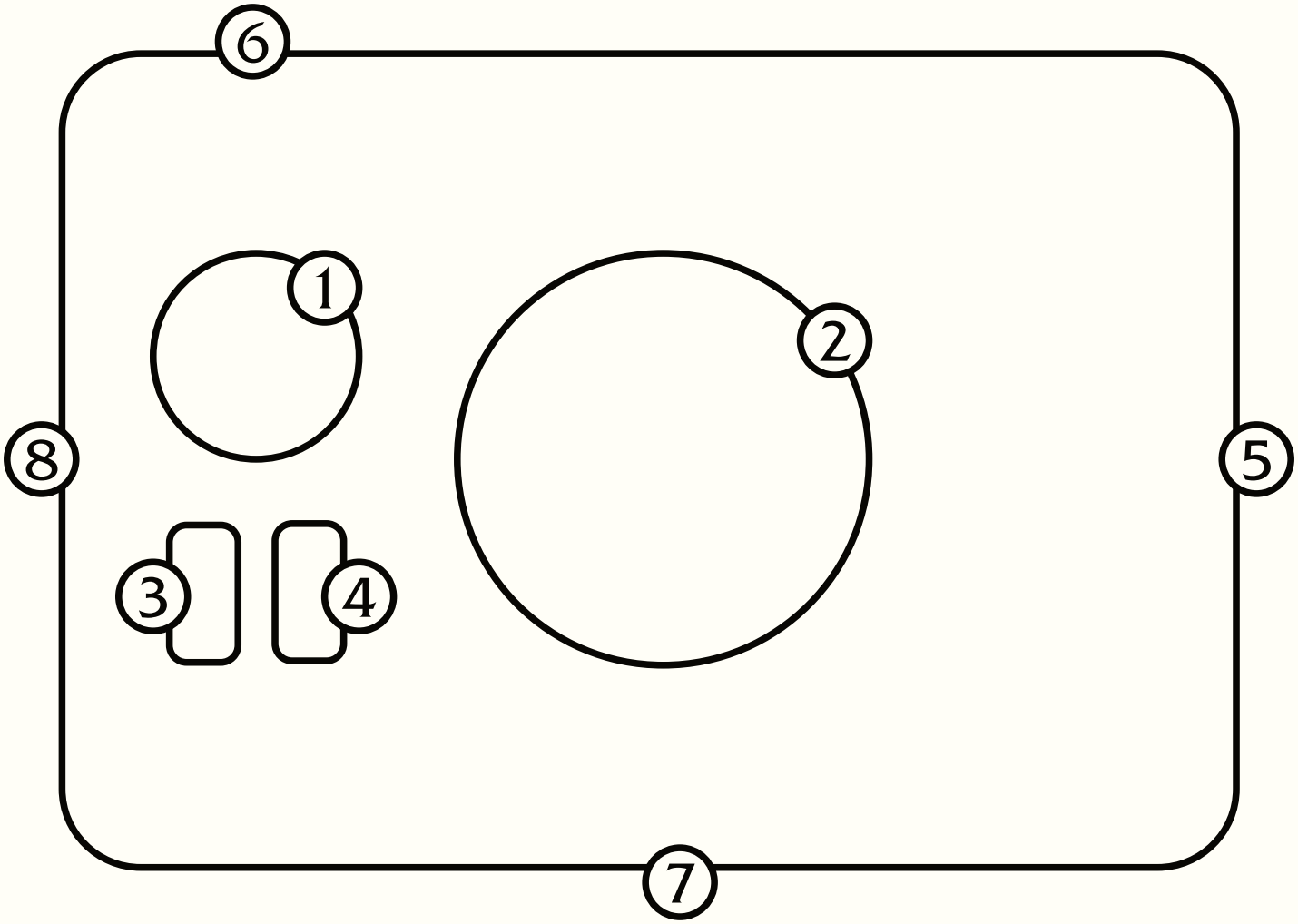


Sharpness: 0.999



Sharpness: 1.0

Interface



1. Gain Adjust Dial
   Used to modify the amplitude of the signal resulting from the main modification circuitry, multiplying it by a number between 0 and 1.

2. Sharpness Adjust Dial
   Used to set the “sharpness” value of the circuit

3. Sharpness Adjust Dial Modifier A
   The Sharpness Adjust Dial has a safety mechanism which prevents the “sharpness” value from being set to ‘1’, instead limiting the value to ‘0.999’. This switch removes that limit.

4. Sharpness Adjust Dial Modifier B
   Switches the value progression of the Sharpness Adjust Dial from linear (the outer ring of numbers seen around the Sharpness Adjust Dial) to exponential (the inner ring)

5. Audio Signal Input
   The audio signal input connection

   CUIS type: Orange

6. Gain Adjust Dial Voltage Control
   A voltage control input connection port which directly modifies the Gain Adjust Dial (1). Control is between the values of 0 and 1.

   CUIS type: Green

7. Sharpness Adjust Dial Voltage Control
   A voltage control input connection port which directly modifies the Sharpness Adjust Adjust Dial (2). Control is between the values of 0 and 1.

   CUIS type: Green

8. Audio Signal Output
   The audio signal output

   CUIS type: Orange