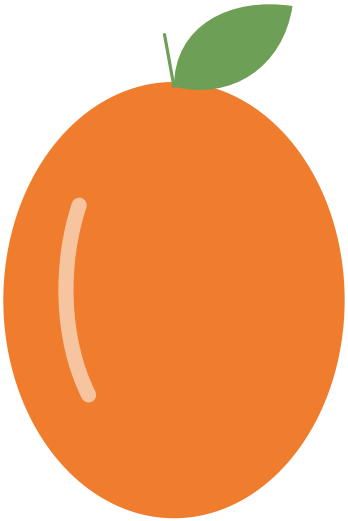


KA Saturator

Instruction manual

Kumquat Audio · Edition 1.7.11 · October 2026

kumquataudio.com

NO. 11

KA Saturator

Adds warmth and weight by bending the sound: Soft, Warm or Hard.

KA Saturator adds warmth and weight by bending the sound. Drive pushes the sound into a curve, and Soft, Warm and Hard are three different curves. It runs at four times the sample rate so that the new harmonics stay clean, and the loudness stays about the same as you turn Drive up, so that you can judge the tone and not only the level.

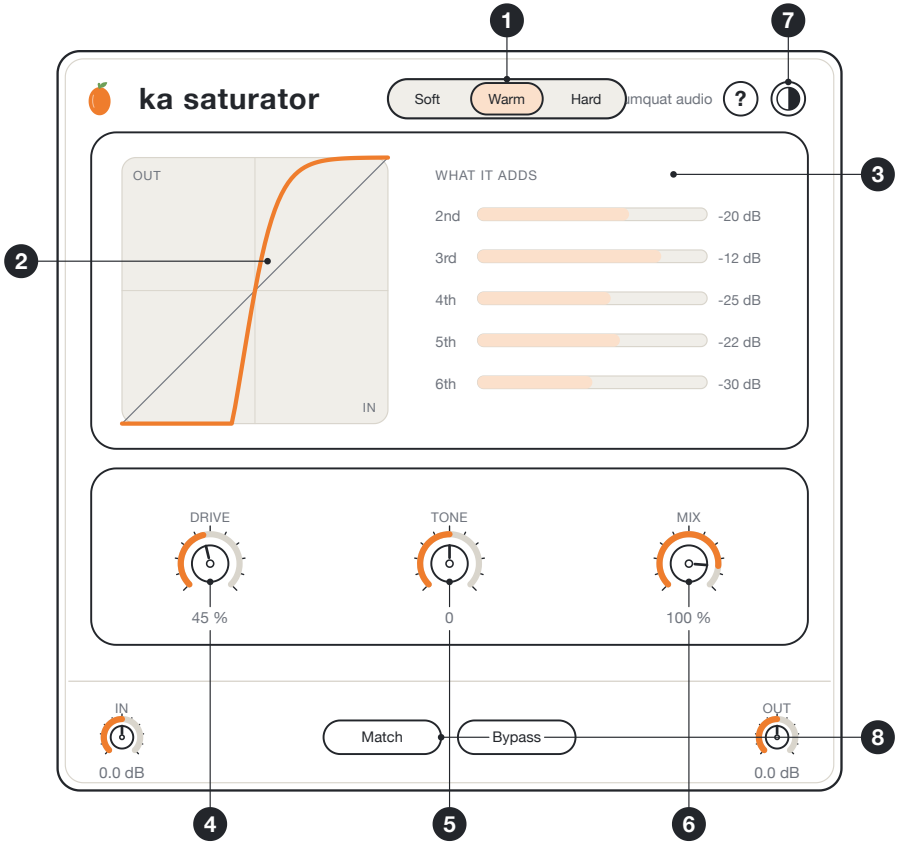


FIG. 1 The parts of KA Saturator. The numbers are explained on the next page.

Parts

fig. 1

1. **Type**
   Soft, Warm or Hard: the shape of the curve that bends the sound.
2. **The curve**
   What the sound is bent by. The straight line is the sound left alone; the bright part is the part your music is using.
3. **What it adds**
   The harmonics that the curve makes, in dB below the main tone. Drag a bar to set that harmonic's level yourself (the small mark shows what the curve makes); double-click a bar to give it back to the curve.
4. **Drive**
   How hard the sound is pushed into the curve. The loudness stays about the same.
5. **Tone**
   Tilts the sound after the saturation: darker to the left, brighter to the right.
6. **Mix**
   How much of the saturated sound is blended with the original.
7. **Help and light/dark**
   The ? turns the pop-up help on and off. The half circle switches light and dark.
8. **In, Out and Match**
   In turns the sound up or down before the plug-in hears it, and Out turns the result up or down. Bypass plays the sound without the plug-in. Match keeps the output as loud as the sound that came in, whatever In and the plug-in do, so you hear what a setting does and not just a change in loudness.

Operation

step by step

1. Put the plug-in on a track or a bus and play something with some body in it: drums, bass or a voice.
2. Choose a Type. Soft rounds the peaks gently. Warm is thicker and rounder. Hard keeps the sound clean until a ceiling and then cuts off flat: edgy and dense.
3. Raise Drive until you hear the tone change. The picture shows the curve bending, and the harmonics it adds.
4. Use Tone to tilt the result darker or brighter, and Mix to blend it with the original (parallel saturation).
5. Switch the plug-in off and on to compare. The level is already matched, so what you hear change is the tone. Use Out to trim.
6. To shape the harmonics yourself, drag a bar in "What it adds" to the level you want for that harmonic (the small mark shows what the curve makes). Double-click the bar to give it back to the curve. A bar you have set stays where you put it as Drive changes.

Controls and settings

range · start

Control	Range	Starts at	What it does
Type	Soft / Warm / Hard	Soft	The shape of the curve.
Drive	0 to 100 %	30 %	How hard the sound is pushed into the curve. (100 % is 30 dB.)
Tone	–100 to +100 %	0	Tilts the sound after the saturation: down is darker, up is brighter.
2nd – 6th harmonic	off to –0 dB below the tone	as the curve makes them	Drag a bar to set that harmonic's level yourself. Double-click to give it back to the curve.
Mix	0 to 100 %	100 %	How much of the saturated sound is blended with the original.
In / Out	In ±24, Out ±12 dB	0 dB	The two knobs under the meters: before and after the plug-in.
Match	on / off	off	Keeps the output as loud as the input. See In, Out and Gain Match.
Live	on / off	off	No oversampling, so no delay at all: for playing through the plug-in. The curve is the same; very bright sounds at high Drive can fold a little more noise back in.

TIP For playing through the plug-in, switch Live on: the delay is 0 samples. Switch it off again for mixing.

How it works

a closer look

Saturation bends the sound. Every sample is sent through a curve: a quiet sound passes almost unchanged, a loud one is bent, and the bending adds new frequencies, the harmonics of whatever is playing. Drive sets how far into the curve the sound is pushed.

Soft rounds the peaks more and more as they get louder, and adds odd harmonics (the 3rd, the 5th). Warm bends the top and the bottom of the wave differently, which adds the even harmonics as well (the 2nd, the 4th): a thicker, rounder sound. Hard leaves the sound alone until it is close to a ceiling and then cuts it off flat: edgy and dense.

New harmonics can be higher than the highest frequency the system can hold, and then they fold back down as harsh, out-of-tune noise (aliasing). To avoid it the plug-in works at four times the sample rate and works out the curve in a more careful way. The cost is a delay of 61 samples, which your music software is told about.

The loudness is kept about the same as Drive goes up, so that a more saturated sound does not seem better only because it is louder. Tone is a tilt round 650 Hz applied after the saturation. A gentle high-pass takes out the offset that the lopsided Warm curve makes.

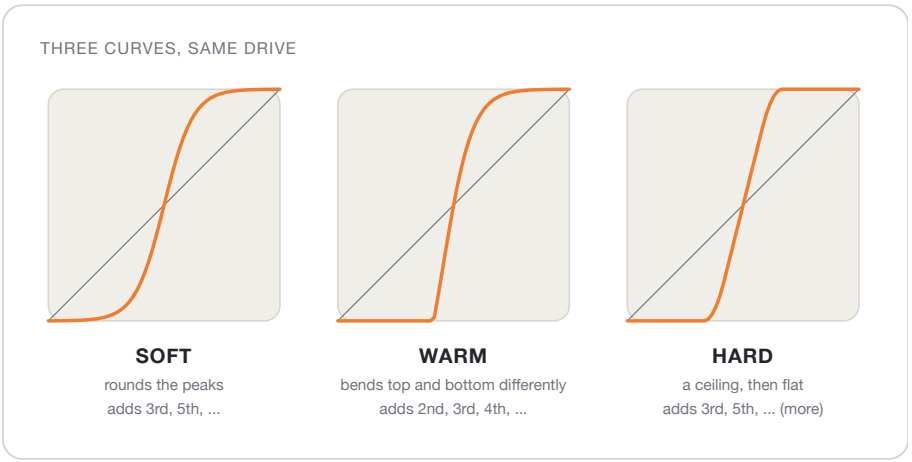


FIG. 2 The three curves, and the harmonics each one adds.

EVERY INSERT PLUG-IN

In, Out and Gain Match

Along the bottom of most windows is a strip with two knobs, one under each level meter, and two buttons. In turns the sound up or down before the plug-in hears it, and Out turns the result up or down. Double-click either knob to return it to 0 dB. Bypass plays the sound without the plug-in (it stays in time with the other tracks, and fades in and out without a click); your music software's own bypass button for the plug-in does the same. The four plug-ins that read whole recordings, and KA Limiter, have the Bypass button at the top of the window instead.

A louder sound almost always seems better, even when it is not. That is how a setting can fool you: you turn something up, the sound gets louder, and you think it got better. Match takes that away. When it is on, the plug-in listens to how loud the sound is as it arrives and as it comes out, and turns the output up or down by the difference, slowly, so the two stay the same. That includes In: drive the plug-in harder and the output stays where it was. Now when you change a setting you hear what it did to the sound, and nothing else. Out is then yours to trim on top.

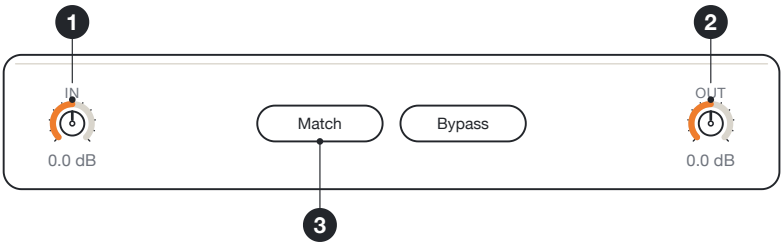


FIG. 3 The strip along the bottom of a window.

1 **In**
Turns the sound up or down before the plug-in hears it.

2 **Out**
Turns what comes out up or down.

3 **Match**
Keeps the output as loud as the sound that came in, whatever In and the plug-in do. The number beside it shows how much it is adding or taking away.

Use In to drive a plug-in harder or softer: more In into KA Saturator or KA Bus Comp gives more effect. Use Out to set the level you want to leave with; with Match on it moves the level up or down from the level that arrived. The number beside Match shows how much it is adding or taking away.

Who has what

In, Out and Match

Plug-in	The strip has	Note
KA De-Esser	In · Out · Match	Match is on hold while Listen is on.
KA De-Noise	In · Out · Match	Match is on hold while Listen is on.
KA De-Verb	In · Out · Match	Match is on hold while Listen is on.
KA De-Click	In · Out	It changes the level so little that matching is not needed.
KA EQ	In · Out · Match	Out is the level after the EQ and the suppressor.
KA Bus Comp	In · Out · Match	Makeup is still there as the compressor's own make-up gain.
KA Saturator	In · Out · Match	Drive already keeps the level close; Match finishes the job.
KA Zing	In · Out · Match	Match is on hold while Delta is on.
KA Contour	In · Out · Match	Match is on hold while Listen is on.
KA Mic Blend	In · Out	In is applied to both mics, including the sidechain.
KA Delay	In · Out	Mix is meant to change the level, so there is no Match.
KA Multiband Comp	In · Out · Match	Each band has its own Gain as well.
KA FET Comp	In · Out · Match	In is the compressor's Input: the threshold is fixed.
KA Opto Comp	In · Out · Match	Out is the compressor's make-up gain.
KA Rider	In · Out	Match would undo the ride, so there is none. Delta plays only the ride.
KA Chladni, KA Root	none	Instruments have no audio input, so no In, Out or Match: use the Level drawing.
KA Reverb	In · Out	Mix is meant to change the level, so there is no Match.

TIP To set a compressor or a saturator fairly: turn Match on, switch the plug-in off and on, and choose the setting that sounds best at the same loudness.

CAUTION KA Limiter has no In and Out: its Threshold is its input and its Ceiling is its output. The four plug-ins that read whole recordings do not have the strip. Every plug-in has a Bypass button.

CARE

Care and troubleshooting

If this happens	Do this
A plug-in does not appear in the list	Restart the music software. In Logic Pro, open the Plug-in Manager, select the Kumquat plug-ins and choose Reset & Rescan Selection.
An old name is still showing	Quit Logic with Cmd+Q and open it again. If it persists, remove the old copies from /Library/Audio/Plug-Ins/Components.
My key was not accepted	Copy all of it, from KA1 to the end, with no spaces added or lost. A key for one plug-in does not unlock the others.
The pop-up help does not show	Press the “?” at the top of the window to turn it on. It is one choice for all the plug-ins.
Which part of the picture does a knob change?	Point at the knob, or hold it down while you turn it: the part of the picture it controls lights up, with the knob’s name and value.
KA Drum Gate, Silence Trim, Auto Mixer or Time Align shows a message instead of a picture	Open Logic Pro using Rosetta, put the plug-in first in the Audio FX list, select a region and press play.
The sound is late	KA De-Click, De-Verb, De-Noise, Contour, Mic Blend, Saturator (it oversamples), EQ (with the suppressor), Multiband (in Linear phase) and Limiter delay the sound a little and tell the music software, which lines everything up. Do not compensate by hand. For playing through a plug-in, the Saturator, EQ and Multiband have a Live switch that takes the delay away; the compressors, De-Esser, Delay, Reverb and Rider have no delay at all.
A window is too small or too big	Drag the corner at the bottom right. The size is remembered, and it is the same for all the plug-ins: make one bigger and the others open that big.
The Limiter pumps	Leave Release on Auto, or set 60 to 100 ms. A release of a millisecond or two is the dirtiest setting.

If something is not right, write to **audiokumquat@gmail.com** and say which plug-in, which music software, and what you were doing.

FOR YOUR OWN NOTES

Notes