VOCALSYNTH

USER GUIDE

iZotope

VOCALSYNTH

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Introduction

Here at iZotope, we specialize in building audio products for music production, post production, and broadcast.

Gripping vocals can be a challenge of complex routing and lackluster approximations of the sounds you've heard and loved. VocalSynth can quickly help you find that unique sound you've been looking for—or experiment and uncover a wild vocal treatment you never even knew you wanted.

We hope you enjoy using VocalSynth on your next vocal production!

  - The iZotope Team

VOCALSYNTH

What is VocalSynth?

OVERVIEW

Ready for a transformative vocal experience? With VocalSynth, the iconic vocal sounds you've heard from decades past and the wild vocal sounds you've only heard in your head are finally within reach. Shape and manipulate your voice to create electronic vocal textures, robot sounds, computerized harmonies, vocoder and talkbox effects, thick octaves or doubles, and everything in between.

Complex, interesting, and unique vocal effects have driven hit songs and launched careers. It's time for your vocals to stand out, too. Explore four re-synthesis engines within a single plug-in—Vocoder, Talkbox, Polyvox, and Compuvox—along with expressive vocal effects and simple, high-impact controls.

Push your vocals beyond the limits with VocalSynth. Think outside the Vox.

DESIGN PHILOSOPHY

If that was the elevator pitch, this is why we did what we did…

iZotopians (now a word) are a dedicated, passionate crew of musicians, producers, and performers.

Our musical output covers many genres, from EDM to pop, rock, metal, hardcore, folk, jazz, hip hop, slam poetry, and gamelan, and can be found in the farthest, darkest corners of the Internet,[*] with the occasional Billboard and Beatport success.

It was this (slightly selfish) enthusiasm for music production that inspired us to design and build ourselves tools to achieve better-sounding, more exciting, and original results in our own vocal production work.

The vision that became VocalSynth started life as a playlist on [generic music service], in which we compiled songs we loved and felt were defined by signature vocal processing. What transpired was a large collection of songs spanning several decades, many genres, and almost every vocal production trick in the book.

We kept asking ourselves, "What would we need to build to get sound x, y, or z?" We had some fun experiments too, some over lunch involving plastic straws, duct tape, speakers, small portable synths, and other extracurricular activities, resulting in some pretty wacky early prototypes in Max/MSP.

With the help of an incredible crew of vocal producers, we distilled what we earnestly hope is the most powerful yet simple and fun package of tools seen in a single vocal product, capable of going after any sound heard on the radio.

We would tell you, but the Internet is a dangerous place.

During the development process, we were subject to many strange glances from friends and family, who could only hear the raw vocalisations, and not the incredible audio processing being fed back via the headphones. If the same happens to you, just know you're not alone.

SIGNAL FLOW

VocalSynth includes Pitch Correction, four processing engines, and five effects. We hope the following signal flow diagram helps clarify the details of the dynamite. Here's what's going on:
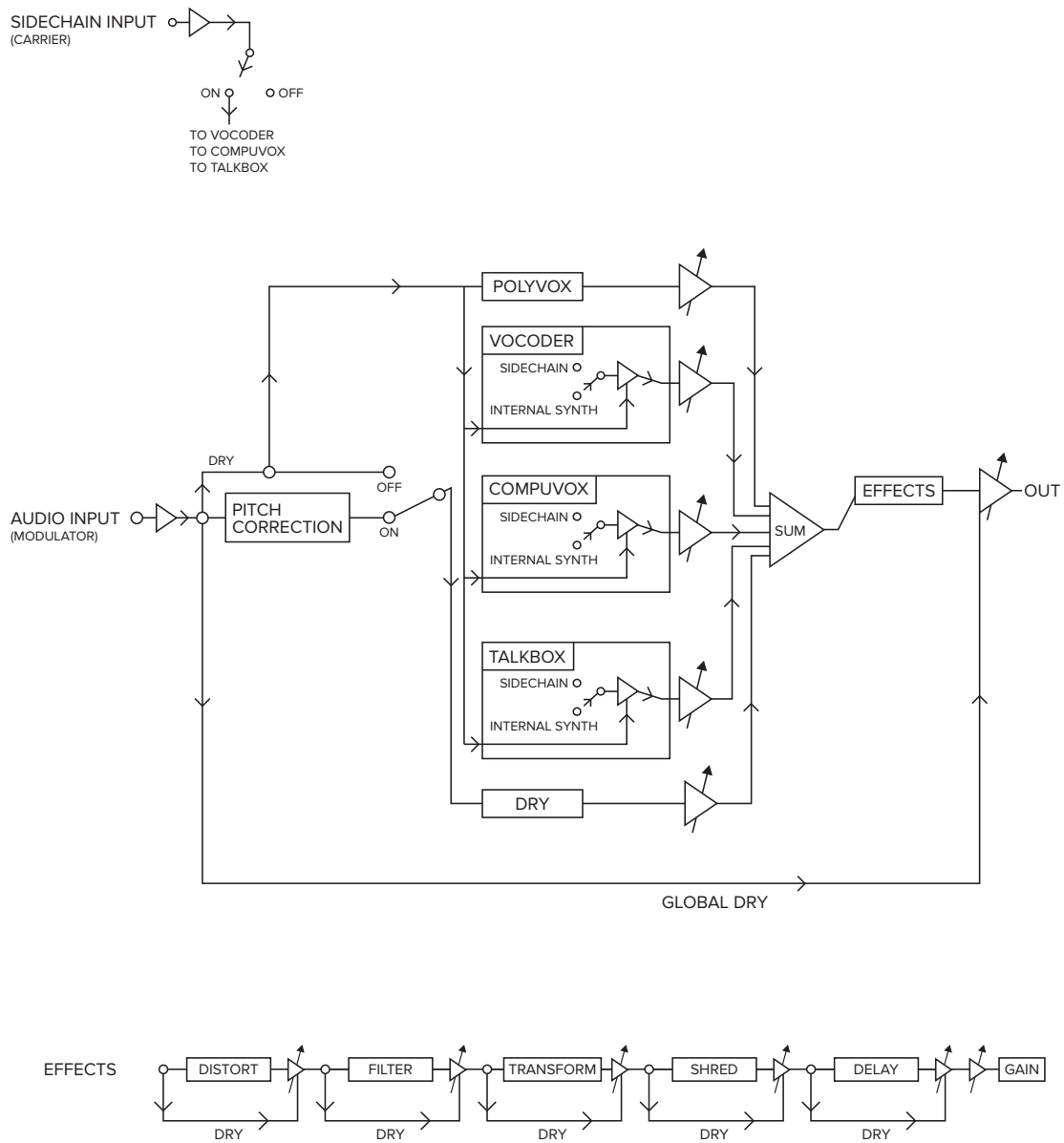
Here's some of the VocalSynth team during our in-studio testing. We're serious, but we're here to party.

AUTO MODE, MIDI MODE, OR SIDE-CHAIN MODE?

VocalSynth is designed to be inserted on a vocal track, which as illustrated in the above diagram, is the modulator.

The internal synthesizers, or external audio routed in via side-chain, act as the carrier signal that is modulated by the voice.

Auto mode

Auto mode analyzes the incoming audio and automatically generates musical note information that tells the internal synthesizers what notes to play, no MIDI required. If you're not a great keyboard player, this mode can be very useful.

MIDI mode

MIDI mode takes musical note information from any MIDI controller and tells the internal synthesizers what notes to play.

Side-chain mode

Side-chain mode bypasses the internal synthesizers, routing an external audio signal, perhaps your favorite guitar or synthesizer, into VocalSynth. Audio routed in via this method will then be modulated by your voice, allowing you to make any audio "talk". Routing in non-traditional audio sources can create some wonderful experimental sounds.

Side-chain setup may differ per host. For detailed setup information, check out our dedicated "How to use VocalSynth in [host]" chapters later in this manual.

VOCALSYNTH

Understanding Pitch Correction
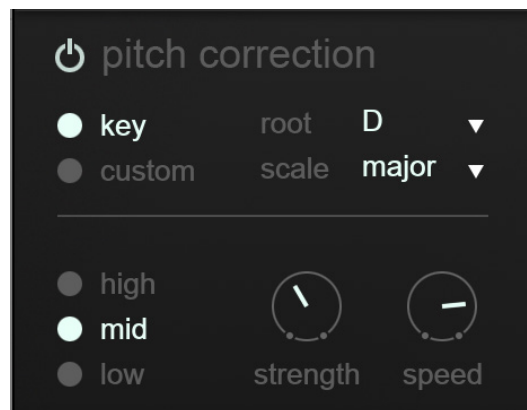
Pitch Correction may be the most controversial and maligned yet ubiquitous and creative vocal production tool around.

When appropriately used/misused, it can be a phenomenally musical asset suited for many uses cases. Whether preserving the organic sensibilities of a performance while fixing a few stray notes or taking it to such noticeably iconic extremes as are popular in a lot of today's musical productions, beauty is in the eye of the beholder, and we hope you'll forge your own path with this tool.

KEY
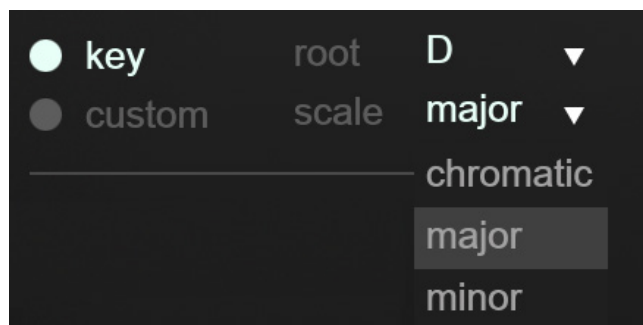
Key mode allows you to manually choose between several predefined scale types.

Root

Here you can define the root note or key that your vocal takes are in. It is important to set an accurate root note as this helps the pitch correction algorithm determine the best possible pitches for your vocals to correct to.

Scale

Here you can select to snap your incoming vocal pitches to either a Major, Minor, or Chromatic scale of your choosing based upon your specified Root note. Chromatic mode is a scale in which every note of every octave will be available as a pitch your vocals could be corrected to. If you are not sure of the scale that your vocal takes are in, be sure to set your scale type to Chromatic in order to get the best results. When in chromatic mode, as every pitched note is available for pitch correction, the defined root note has no effect and is disabled.

CUSTOM
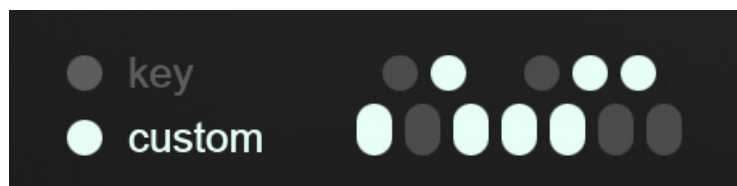
Custom mode allows you to create a unique scale type. This can be useful for creative effects, such as locking a vocal to only a few pitches, or practical, such as creating a particular scale (e.g. pentatonic).

When defining a Custom scale, click on any notes of the keyboard that you wish to enable/disable as options for pitch correction. When the individual notes are enabled, they'll display a bright white.

RANGE

The human voice varies greatly, from the deep richness of Barry White to the infamous high tones of Florence Foster Jenkins. Though Barry White certainly never needed pitch correction, when it *is* used, it may perform differently depending on the voice type.

As such, range controls how VocalSynth detects and analyzes any incoming vocal data. There are three options: Low, Mid, and High. Start with the Mid setting for most audio applications. If you notice any undesirable behavior or artifacts in the detected pitches, experiment with the Low and High options to achieve the best results.

When VocalSynth is in Auto mode (generating voices automatically, rather than via MIDI), the range control will affect how the pitch tracking affects the oscillators. If the Range is set to High and you're singing Low, the oscillators in the Compuvox, Vocoder, or Talkbox won't be able to follow you effectively (though this may produce unpredictable, zany effects you like).

SPEED
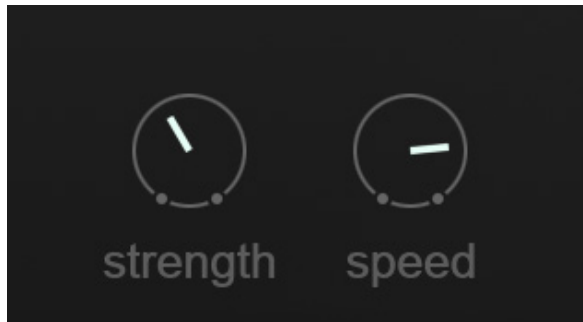
Speed determines how quickly your incoming vocals will be snapped to any particular note.

Speed ranges from 0 to 100 ms. Values closer to 0 ms achieve robotic, immediate pitch snapping, whereas values higher than 50 ms obtain more natural and transparent results.

STRENGTH

Strength adjusts how closely the pitch correction will pull your voice to the correct frequency. Lower strength values may not perfectly correct a pitch, but will lessen any tuning issues. This tends to sound more natural, but if you're after the more robotic T-Pain, Lil Wayne, or Will.I.Am sound, you'll want Strength turned to maximum.

VOCALSYNTH

Understanding Polyvox
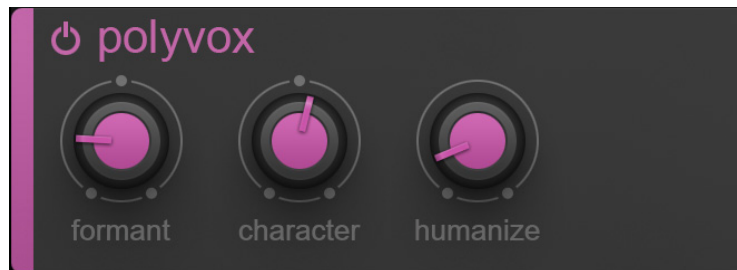
Whether you're looking to create natural vocal harmonies reminiscent of a human choir, or the hard-synced, grainy, and computerized harmonies popularized by artists such as Imogen Heap, or even formant-shifted otherworldly sounds, the Polyvox voice generator is for you, 20 feet from your new-found stardom.

Sure, there are times you'll want to track additional backing vocals. We encourage that! Polyvox not only helps with part writing, as you play in new harmonies with MIDI, but can create new sounds not possible with tracking voice(s) over and over again that are effective alone, or even blended in with performed, recorded backing vocals.

WHAT IS A VOICE GENERATOR?

Voice generators come in all shapes and sizes but are based on a similar fundamental concept: sampling an incoming audio signal and then creating multiple additional versions of this audio signal using time/pitch stretching to achieve different intervals, such as an octave down, a third up, and so on.

Voice generators are most commonly used on voice but there are many examples of this type of technology being used in guitar effects as well, usually some combination of pitch/whammy adjustment.

FORMANT

Formant transposes the vocal formants of the signals it reproduces. This type of control is often talked about as the difference between deeper voiced and higher, chipmunk-style sounds.

CHARACTER

Character controls the relationship between the incoming vocal's formant envelopes and how they are applied to the outgoing sound.

A higher value will cause the formants themselves to shift more in the direction of the pitch of the audio (e.g. sing a higher pitch, formants scale upwards). Interestingly, this parameter can be used to increase naturality, if, say, the generated voices were consistently a lot higher or lower than the original source, or it can be used to push a voice into a sonic realm the human voice-box isn't capable of. Pro tip: This is a lot safer than Helium.

By default, the voices generated by Polyvox will sound like your voice singing at potentially different pitches. The algorithm preserves the formants of an incoming vocal exactly as is...crucial for a natural sound.

HUMANIZE
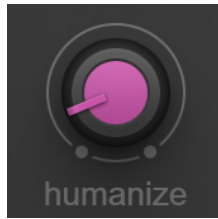
Humanize gives generated voices subtle variations in time and pitch offset, reducing phase cancellation and increasing realism up to a point.

A higher Humanize value will start to introduce more extreme variations to the point of detuning, a very powerful auditory sensation, especially when done in unison. You can use this as a new kind of double-tracking to make a voice sound bigger and more expansive than ever.

Some of the most musical performances are by no means always locked religiously to a timing grid or pitch...quite the opposite! You may decide the same is true for the vocals you're designing.

VOCALSYNTH

Understanding Vocoder

As with a lot of today's musical technologies, the vocoder (short for VOice enCODER) began life as a completely non-musical, utilitarian piece of electronic equipment.

One of the earliest vocoders was developed by Homer Dudley in the late 1920s/early 1930s at Bell Laboratories. Large-scale telephone networks were being implemented at the time, and the vocoder was developed as a potential solution to bandwidth issues. These early tools were designed to encode speech to reduce bandwidth, allowing multiple voice signals to be transmitted over the same cables. Vocoders even underpinned pivotal World War II technologies, such as the SIGSALY system used for secure voice transmission.

Fast forward a few decades and the vocoder was starting to be used in some iconic musical applications. Early pioneers such as Werner Meyer-Eppler paved the way for Robert Moog and Wendy Carlos as well as Kraftwerk. In the early 1970s Moog and Carlos

built a vocoder in which the carrier signal was a Moog modular synth and the modulator a mic input, which was heard several times on the soundtrack to Stanley Kubrick's film adaptation of Anthony Burgess' *A Clockwork Orange*[1].

Over the years vocoders have become so well known, audible on anything from ELO's *Mr. Blue Sky*[2] and Michael Jackson's *P.Y.T. (Pretty Young Thing)*[3] to Coldplay's *Midnight*[4] and now... whatever you'll be using VocalSynth on next!

WHAT IS A VOCODER?

A vocoder relies on two signals, a carrier (synthesizer) and a modulator (usually a voice).

Both of the incoming signals are split into a number of frequency bands. The total number of bands can be as low as four or eight bands but sometimes 512 bands or higher. The amplitude of the modulator signal in each individual band is then used to control the amplitude of the corresponding bands of the carrier signal.

This has the auditory effect of mapping frequency characteristics of the modulator (voice) as amplitude changes in each of the frequency bands on the carrier (synth) signal, resulting in what we hear as talking synthesizers.

VOCODER FEATURES

Shift

This parameter will alter the frequency shift of each of the vocoder bands. This will change the pitched timbre of the vocoded signal (higher values will cause the timbre to sound higher and brighter but may have less bass, and vice versa).

1 Carlos, W. *A Clockwork Orange.* Warner Bros. Records. 1972. LP
2 Lynne, J. *Out of the Blue.* Jet. 1977. LP
3 Ingram, J., Jones, Q. *Thriller.* Epic. 1982. LP
4 Berryman, G., Buckland, J., Champion, W., Martin, C., Hopkins, J. *Ghost Stories.* 2014. LP

Contour
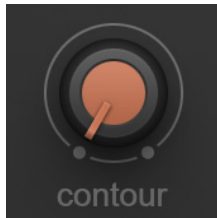
This has the effect of helping you "focus" the frequency range of the vocoder.

Contour affects the gain of the bands, boosting or attenuating them to approximate the typical curves people typically would get from the graphic EQs many hardware vocoders have.

Sonically, this will usually sound like a nice bass or treble frequency boost. The mid isn't boosted quite as much so at the extreme, giving you a more "hi-fi"style smile curve.

Scale
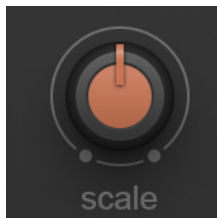
Scale adjusts how quickly the vocoder responds to changing vowel sounds. Higher values may increase the articulation of the synthesized output, whereas lower values may sacrifice intelligibility for softer-sounding, more evolving pad-style results.

Osc

The Vocoder has a powerful internal wavetable synthesizer which acts as a carrier signal if no audio sidechain is present for the vocal to modulate.

This parameter lets you choose between different synth patches in order to accomplish a variety of timbres. A patch may include variations in the oscillator waveforms, attack and release, and other settings.

Mode knob
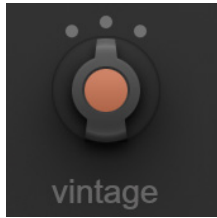
The Vocoder has three different modes which alter the response to high frequencies in both the modulator (voice) and carrier (instrument) input.

- Smooth is reminiscent of early analog vocoders with wider resolution to give a pleasant, smooth sound that is still intelligible.

- Vintage is the classic analog vocoder sound with musically spaced frequencies for a moderate level of resolution and a timeless sound.

- Hard is a modern analog hybrid rooted in the classic vocoder designs but with greater resolution for a more articulate overall sound.

VOCALSYNTH

Understanding Compuvox

Compuvox is based on a technology known as linear predictive coding (LPC) which has existed since the late 1960s.

As with a number of the audio processors in VocalSynth, LPC was originally a communications technology for encoding intelligible speech at low bit rates to save bandwidth. Nowadays this computerized vocal sound is often used as a special effect common in electronic music production. The outcome sounds similar to infamous toys like the Furby, Speak n Spell (which uses LPC), and even older text-to-speech technologies. You can hear some great examples of LPC all over Kraftwerk's 1981 album *Computer World*[1].

When we vocalize, our lungs expel air. This air is modulated by our vibrating vocal cords, creating buzz. This buzz then travels our vocal tract (throat and mouth), which imparts resonances and formants. Plosives (Ps and Bs), other pops, and other sibilant moments happen on the way out via the tongue and the lips.

_____

1 Hutter, R., Schneider, F. *Computer World.* Kling Klang. 1981. LP

That's enough anatomy for right now. The point is not to get too visceral here but to celebrate how amazing our ability to vocalize actually is, which makes LPC's ability to approximate human speech even more impressive. Compuvox is pretty special! We sincerely hope you enjoy the magic as much as we do.

HOW DOES COMPUVOX WORK?

Compuvox breaks down the vocal signal into two components. It simultaneously estimates the formants alongside the "excitation," which is the buzz or noise created by the vocal folds. This information can then be used to recreate the sound of the vocal signal by synthesizing the excitation and filtering it through a formant filter. The simplifications that this model makes lead to some wonderfully cool artifacts.

COMPUVOX FEATURES

Bits
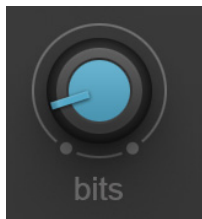
This control adds digital aliasing noise to the signal by resampling it using a low-quality technique known as zero-order hold interpolation. Used gently, this can add an interesting inharmonic quality to the sound. Pushed farther, this control can reduce your audio to almost unrecognizable levels of digital chaos.

Bytes
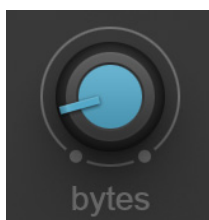
During the analysis process, Compuvox establishes an idea of the vowel sounds. Bytes allows you to artificially prolong vowel sounds. Stretching vowels out in this way can create some interesting non-human yet musically useful vocal effects.

Bats

The Bats control increases noise and vocal gravel for a winged-animal-man effect.

Though we love superheroes, we aren't legally allowed to claim we've modelled any specific superheroes, nor have we. There's also internal disagreement about which film incarnation of said superhero is the best.

There are some genuinely fun, diverse, and practical ways to use this control. With a lead vocal, especially in some rap, EDM, or metal tracks, pushing Bats close to 100%, but then using the Mixer to only blend in a small amount of Compuvox helps fill out the bottom of the vocal with some really solid noise full of emotion and inflection.

Osc

The Compuvox has a powerful internal wavetable synthesizer which acts as a carrier signal if no audio side-chain is present for the vocal to modulate.

This parameter lets you choose between different synth patches in order to accomplish a variety of timbres. A patch may include variations in the oscillator waveforms, attack and release, and other settings.

Mode knob
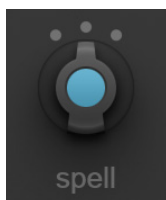
Compuvox has three different modes that represent multiple different flavors of LPC processing. They react differently to varying types of incoming vocals so experiment with each mode to find the setting that works best for your audio.

- Spell is the most balanced LPC setting, using medium strength and size filtering for an articulate and classic sound.

- Read is the strongest high-order filter mode; it also contains a smaller window size and a faster analysis to give you a narrower sound.

- Math is the broadest setting; it contains a wider windowing size, a more gentle filter, and a reasonably fast analysis speed to give an alternate timbre and sound.

VOCALSYNTH

Understanding Talkbox
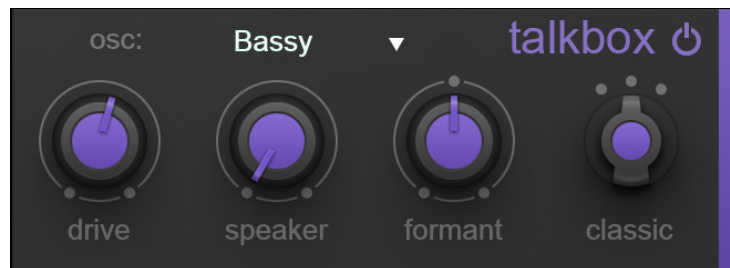
If you want a guitar, synth, or bass line to wail and scream with all the angst and impact of a voice, this module is for you!

Since electronic audio manipulation first became possible, humans have sought new and exciting ways to transfer the essence of human voices to the timbres of other musical instruments. Long before Daft Punk went *Harder, Faster, Better, Stronger*[1]...before Jimi Hendrix made his guitar sing on *Voodoo Child*[2]...before even guitars gently wept...before Chet Atkins began to use an early wah pedal in the 1950s, we had early sonic innovators trying devices such as the Sonovox. A classic example of the Sonovox in action can be found at this link. What's not to love about Train Casey Jr.?! But we're here to talk about Talkbox, so, moving on...

1 Bangalter, T., Birdsong, E., de Homem-Christo, G. *Discovery.* Virgin. 2001. LP
2 Hendrix, J. *Electric Ladyland*. Reprise Records.1968. LP

WHAT IS A TALKBOX?

The first "modern" Talkbox can arguably be attributed to Pete Drake (and his talking guitar), audible on his 1964 album *Forever*[3]. Made famous by musicians such as Stevie Wonder, The Who, Peter Frampton, Bon Jovi, Zapp and Roger (and many more), a Talkbox is one of the most recognized manifestations of our human obsession to find new ways of audibly expressing ourselves. Sometimes they're used to humanize non-traditional sounds such as the voice of BB-8 in *Star Wars: The Force Awakens*, which was synthesized via a talkbox using the vocalizations of Bill Hader and Ben Schwartz.

A traditional talkbox is not dissimilar from a Vocoder which uses a Carrier and a Modulator signal(s), transferring certain qualities of the Modulator (voice) onto the Carrier (instrument).

A Talkbox's audio input can be considered the Carrier signal. Often a guitar or a synth is plugged into this input and then transduced via a compression driver in an airtight environment with some filtering, all of which results in some seriously awesome fuzz.

The sound waves have only one way out, down a length of vinyl tubing. This pipe itself has resonant qualities to it and terminates in the performer's mouth. Audio travelling out of the pipe is filtered by the performer's mouth (the Modulator in this scenario) altering the harmonic content, imparting resonances and inflections otherwise known as formants. Formants are distinctive frequency components usually represented by peaks in the amplitude/frequency spectrum that are what we recognize as speech or singing.

It's this storied heritage to which we pay homage with a few groundbreaking modern twists.

I DON'T HAVE A LENGTH OF PIPE TO CHEW ON... SO HOW DOES VOCALSYNTH'S TALKBOX WORK?

VocalSynth's Talkbox doesn't just emulate the sound of the compression drive and airtight chamber; it is able to intelligently analyze an incoming audio signal, extracting an accurate map/envelope of the formants without need for the hardware. If you've never tried playing a real talkbox, getting truly intelligible words with a length of pipe in one's mouth is, well, wayyy harder than it seems, something which VocalSynth makes a little more ergonomically comfortable.

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3 Drake, P. *Forever*. Mercury Record Corp.1964. LP

TALKBOX FEATURES

Drive
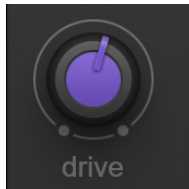
Drive increases the input gain into the Talkbox, which at higher levels will increase the overall distortion, enhancing that crunchy effect.

The additional harmonics generated by the overdrive can help increase intelligibility as there's effectively more frequency material for the voice to modulate.

Speaker
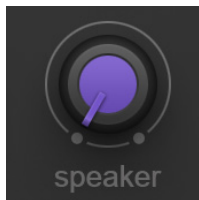
Speaker uses convolution to accurately reproduce the internal acoustics of a talkbox. The compression driver is usually sealed within a guitar pedal or similarly metal box which imparts a characteristic sound on the audio.

Increasing this control blends in more speaker emulation.

Formant
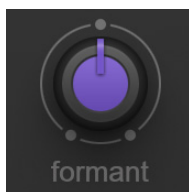
Since the talkbox algorithm is able to extract formants from the incoming vocal, this control enables you to do something simply not possible with any other talkbox: Shift the formants.

The deep, raspy, throatiness of a talkbox can sound very different from person to person... so if your vocal formants aren't doing it for you, experiment by shifting them with this parameter. As a famous producer probably once said, "Try everything at least once."

Osc
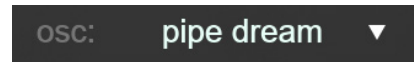
The Talkbox has a powerful internal wavetable synthesizer which acts as a carrier signal if no audio sidechain is present for the vocal to modulate.

This parameter lets you choose between different synth patches in order to accomplish a variety of timbres. A patch may include variations in the oscillator waveforms, attack and release, and other settings.

Mode Knob
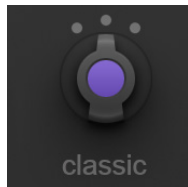
The Talkbox has three different modes which alter the response to high frequencies in both the modulator (voice) and carrier (instrument) input.

- Dark offers a much broodier, bassy sound.

- Classic is the default and the most reminiscent of a classic talkbox.

- Bright features a very hyped high end which maximizes bite and articulation.

VOCALSYNTH

Understanding VocalSynth's Effects

VocalSynth includes five different effects in series, tuned specifically to sound good on vocal material.

Covering a healthy range of saturation, shaping, rhythmic manipulation, and spacialization, these effects are:

- Distort

- Filter

- Transform

- Shred

- Delay

DISTORT
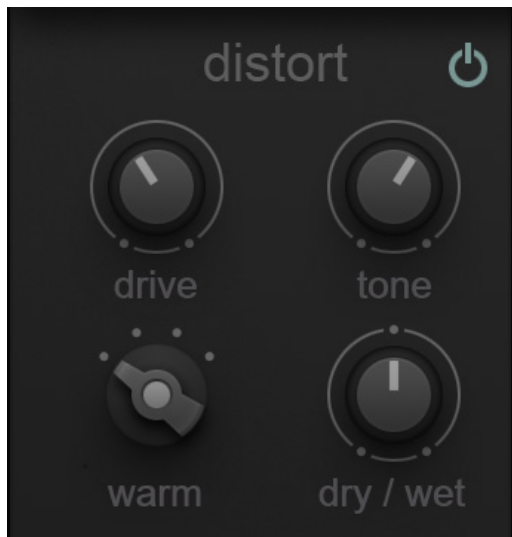
The Distort module imbues your vocal tracks with an essential grit, attitude, and perceptual power. It achieves this with a waveshaper distortion and several different algorithms.

A waveshaper creates complex harmonics in an audio signal by mapping the input signal (dry) to a new output signal (wet) based on the current "shape" of the waveshaper's curve.

There's something unique and fun about the way a waveshaper sonically transforms a vocal, the most important areas of which are the tonal elements between 300 - 900 Hz and the sibilant presence between 8 to 15 kHz.

Drive

This has the effect of subtly increasing overdrive by altering the amount of processing applied from the selected distortion type.

Tone

Tone uses post filtering to change the spectrum of the distorted signal.

It influences the way the distortion created by the waveshaper sounds. Pushing Tone clockwise enhances higher frequencies by reducing lows, and vice versa, counter-clockwise will create a softer sound by reducing highs.

Type

Distort has multiple waveshapes:

- Warm

- Analog

- Edgy

- Fuzz

Dry/Wet

At the extremes, waveshaping distortion can be a little harsh, so blending the dry, unprocessed signal with the wet distorted signal is a good way to take the edge off and give a vocal some more presence.

FILTER

When processing vocal(s), filters are both a practical necessity (eliminating unwanted air and rumble) and a transformative tool in the sonic arsenal.

VocalSynth's Filter has four distinct flavors, each of which is a lovingly curated special sonic flower… and some of which have an intriguing dark side. Try it for yourself… and see what happens when you choose Scream then inflate the Res and sweep the Freq.

Freq

This sets the center frequency of the filter. For the HP/LP and Combo filters, the center frequency is the point at which frequencies begin to roll off. For the Scream filter, it's simply the center frequency of the filter boost.

Res

"A filter is nothing without resonance" says (we hope) every synthesis enthusiast ever. That's a bold claim, but stay with us... resonance is what happens when a narrow band of frequencies around the center frequency are amplified.

Type

There are four different types of filtering available in VocalSynth:

- Combo combines both flat HP and LP filters in a single sweepable control. Moving it downward engages a low-pass filter, moving it up engages a high-pass filter. In the center neither filter is applied.

- Scream is a very sharp resonant filter with a lot of amplification around the center frequency for aggressive peaks and overdrive.

- New York LP and HP filters are based on an analog filter design originally developed in upstate New York in the 1960s. These filters have since become ubiquitous for their warm, buttery quality, a magic they bring to the low end of a vocal fundamental, or the high sibilance and presence.

Dry/Wet

This blends the dry unfiltered audio with the processed audio.

TRANSFORM
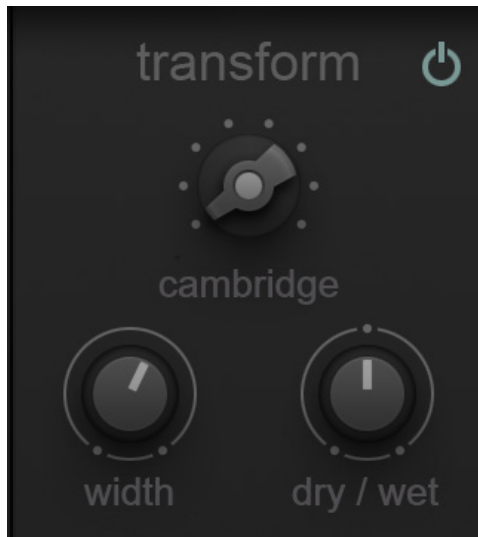
Transform is a convolution effect modeling a variety of guitar cabinets, speakers, and other devices that are key to significantly shaping a vocal sound. Re-amping a vocal through guitar amps is a commonly used production effect.

The Transform's Impulse Responses also provide a natural post-filtering counterpart to distortion and filtering.

Type

There are multiple Impulse Responses available:

- Hollow is a recording of someone knocking on an empty briefcase and, weirdly, this imparts a really cool sound.

- Bright samples an air pump that made a high, airy sound we thought sounded cool.

- Creep is an IR that various folks at iZotope have used and enjoyed for years but the original source has been lost to the ages. After asking around to see if anyone remembered, many explanations of Creep were volunteered, none of which can be printed.

- Bass has a heavy mid scoop which is often used to give vocals a more polished, broadcast sound.

- Radio will place your voice inside a 1960s transistor radio speaker/ cabinet.

- Stirling is a smaller amplifier with a low end drop-off and a heavy emphasis around 3 to 5 kHz for are more biting sound

- Oxford is a popular 2x10 cabinet with a heavy mid range bump 700 Hz to 3 kHz and a steeper cutoff above 4 kHz.

- Cambridge is a popular 2x10 cabinet with a "smile curve" mid range dip and a more gradual cutoff above 5 kHz.

Width

This is a blend control sweeping the overall stereo balance of the convolution effect between mono, stereo, and 2x stereo.

If your vocal track is mono, make it dual-mono (on a stereo track) in order to hear the effect of Width.

Dry/Wet

Blends the dry, un-convolved audio with the processed audio.

SHRED

With vocals playing such an essential and ever-more varied role in music production, we were inspired to introduce a new version of our beat-mangling juju. Shred is a unique granular beat manipulation module that continuously pulls audio into a buffer, offering control over the size of the audio sample and the amount it's repeated. It's really cool when used in Host Sync mode, adding some really zany yet musical percussive vocal effects.

Timing

In a conventional delay, or echo, the timing factor controls the regularity with which audio is repeated.

Here however, Timing is the size (in milliseconds or tempo synced divisions) of the sampled audio window pulled into the buffer, not the regularity with which it is repeated. For example, if Host Sync is on, setting Timing to ¼ will repeat the first quarter note of each captured bar.

Intensity

A feedback control of sorts, Intensity adjusts the amount of processed signal that is fed back into the input of the Shred effect.

Dry/Wet

Blends the dry, un-shredded audio with the processed audio.

DELAY
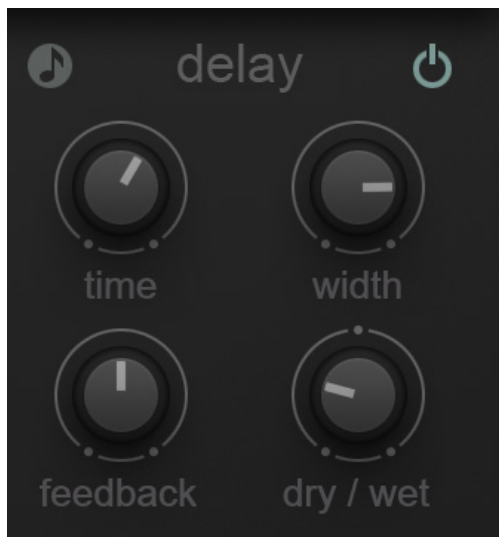
Time

The Time parameter determines the amount of time that will pass before each successive repeat of a dry audio input. Time has two modes, either host synced or free running.

When synced to the DAW, Time supports values between 1/32 and 4. These values can be specified in subdivisions or multiples of one musical beat, determined by the DAW's time signature and beats per minute.

When free running, Time supports values between 0.1 and 1000 ms.

Width

This is a blend control, sweeping the overall stereo balance of the convolution effect between mono, stereo, and 2x stereo.

Feedback

The Feedback parameter adjusts the gain of the delay feedback, controlling how much the signal is repeated before it is faded out. Low values allow for the creation of tight, slapback, bouncing delays, whereas higher values result in longer audible feedback for symphonically large amounts of repetitive delay.

When increasing this control to 100%, special delay effects can be created. While they may produce interesting results, these effects can also grow to be very loud. Be mindful of the levels of your audio when adjusting this control into higher percentages.

Dry/Wet

Blends the dry unprocessed audio with the processed audio.

VOCALSYNTH

General Functions

General functions may not be as sexy or exciting as wailing on a Vocoder or a Talkbox, but they exist for a reason. Thus, here are those reasons...

X/Y PAD
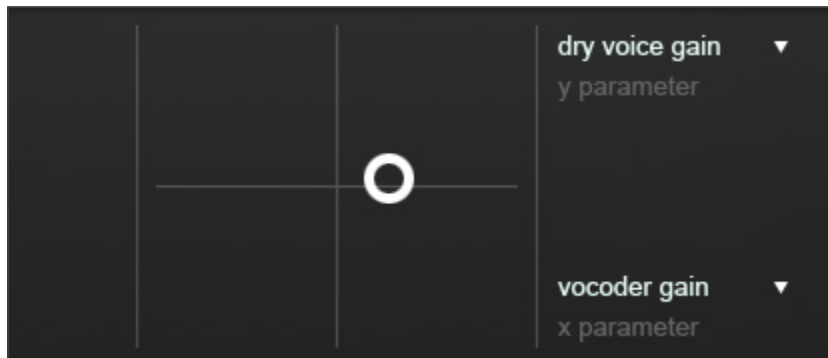
We lied... This one is sexy and exciting.

You can assign any parameter to either axis and then manipulate accordingly to discover interesting new sounds. Parameters adjusted using the X/Y pad can be written as automation.

Assigning two related parameters, such as Shred's Timing and Intensity to X and Y, is an interesting and easy way to get more control over that effect or discover sweet spots between the two parameters. Assigning unrelated parameters, such as Polyvox's Formant, and Vocoder's Contour, can create some interesting textural changes.

WAVE-METER
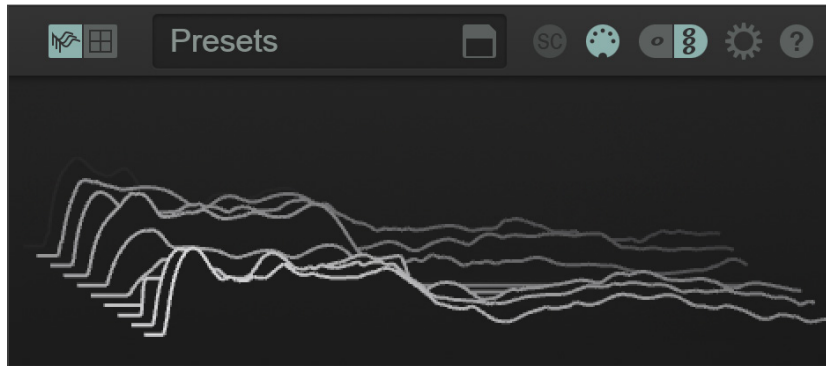
A vocal that sounds good deserves to look good too and that's what the wave-meter's for.

Wave-meter monitors Output signal, so if you're seeing action but hearing nothing, the problem isn't VocalSynth. If you're not seeing action then VocalSynth either has no input signal or something crucial like a Gain fader is turned down.

OUTPUT

Output gain

This applies a clean gain adjustment to the overall output of the plug-in with a clip indicator to let you know if the output's driving too hot.

Master dry/wet

This mixes the global processed (wet) and unprocessed (dry, pre-FX) signals.

VOICES
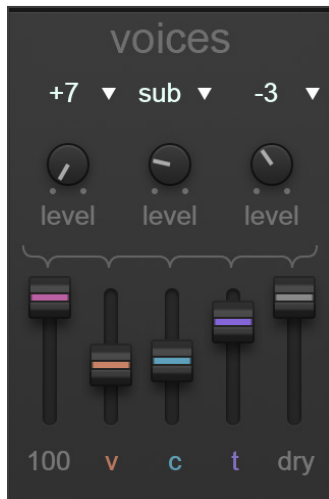
As explained earlier in Chapter "What is VocalSynth?", there are three main ways to create voices… Auto mode, MIDI mode, and Side-chain mode. The following parameters are specific to Auto mode:

Interval

For each of the three auto voices you may define an interval.

This interval is how far away, diatonically, the new harmony will be from the root note of the musical key. The musical key is defined in the Pitch Correction (which doesn't have to be enabled).

Level

This sets the volume of the voice that's created and sent to the four modules.

Mixer

The mixer has five gain faders useful for blending different processors together.

The faders p, v, c, and t correspond to the four modules (Polyvoice, Vocoder, Compuvox, and Talkbox). The fader labeled dry allows you to route some dry signal into the FX. You'll still have access to true dry signal, pre any FX, up top with the Master Dry/Wet knob.

MONOPHONIC SWITCH

- Mono means only one pitch can be played at a time, but playing notes consecutively will not retrigger the internal envelopes. This is the single note icon.

- Poly (or polyphonic) means multiple pitches can be played at once (known as polyphony) like chords with lines or melodies that might have overlapping voices. This is the multi-note icon.

USING THE PRESET BROWSER

VocalSynth ships with many presets covering a wide variety of iconic sounds, genres, and interesting textures.

1. Clicking the Presets button brings up the Preset Browser Window.

2. Clicking on any preset in the list will immediately apply the associated parameters to VocalSynth.

   a. Double clicking on any preset in the list will immediately apply the associated parameters and also close the Preset Browser.

Working Settings

If you decide not to use a preset and would like to apply the last settings used that were not associated with a preset, you can select *<Working Settings>* to return parameters to the previous state.

Default

Select *<Default>* to return all parameters to the default state of VocalSynth.

Preset Information

Below the list of presets, some text details the parameter settings associated with the selected preset.

If you select a preset and change any parameters in the plug-in, the preset name in the Preset Browser's list will have an asterisk before it. This simply indicates that your current settings differ from those associated with the preset as it was last saved. Simply click the preset name in the Preset Browser list once to return your plug-in parameters to the associated preset's saved state.

Adding and removing presets

The Preset Browser includes methods for creating new presets, creating new folders, and deleting presets.

To create a new preset:

1. Set the parameters in VocalSynth to the values you wish to save and open the Preset Browser (as described above). You can click *<Working Settings>* in the Preset Browser to confirm that the settings of the plug-in are set to match your expectations of what should be saved in the preset.

2. Click the *New Preset* button in the Preset Browser. You will be prompted with an edit box to enter a name for this new preset. This will create a new preset with the parameters saved from the *<Working Settings>* and will save to the same location as all VocalSynth presets (see "Preset storage location" below).

    a. Note that if you in a subfolder or have a subfolder selected in the Preset Browser your new preset will be created within that subfolder rather than at the top level of the preset directory. This preset can then be used in your workflow as you would any other preset. If you so choose, you can give your preset a custom comment by clicking the text that says *[Click here to comment]*.

3. For better organization, the Preset Browser also allows you to create a new folder in which to place any preset. To do this, click the *New Folder* button in the Preset Browser. You will be prompted to give the folder a name. To move any preset or even any folder into another folder in the Preset Browser, click and drag the preset or folder you want to move, place it in the expanded folder, and release the mouse.

To rename any item in the Preset Browser, click twice on the preset name or folder to bring up an edit box.

To delete any item in the Preset Browser, select the item and click the *Delete* button. A dialog box will appear to confirm your choice.

Preset storage location

The presets used in VocalSynth are stored on disk:

-   Windows: C:\Users\<your_user_name>\Documents\iZotope\VocalSynth\ Global Presets

-   Mac: /Users/<your_user_name>/Documents/iZotope/VocalSynth/Global Presets

This folder contains the presets included with the installation and any custom presets you have added via the Preset Browser. Keep in mind that factory defaults can be restored by deleting the Presets folder and reinstalling VocalSynth.

OPTIONS MENU
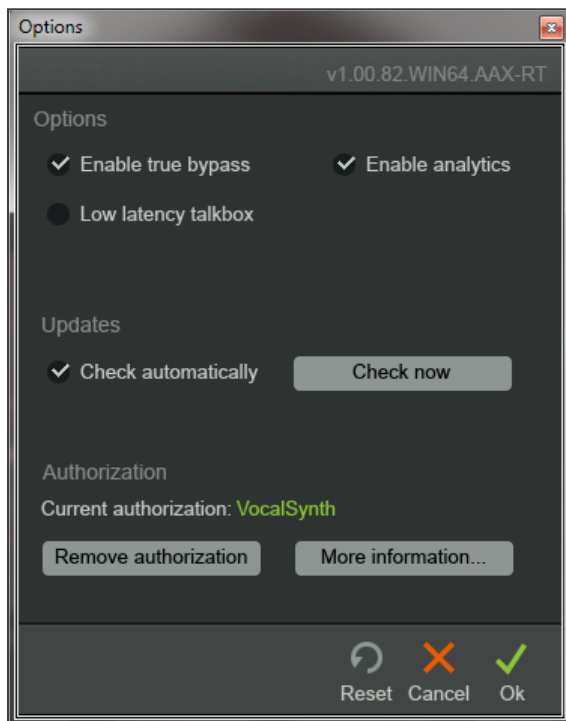
Enable Analytics

This helps iZotope improve VocalSynth by sending anonymous usage statistics. You may disable this functionality if you prefer not to opt-in.

Enable True Bypass

To ensure seamless transitions (no audible clicks or ramp up times) when enabling/disabling modules, the DSP is always running in the background.

Enabling True Bypass means that when disabling a module or effect that particular DSP is fully disabled rather than running in the background. This saves on CPU resources and latency.

Optimizing performance by enabling True Bypass means that you may hear audible transitions when enabling/disabling modules or effects. This may make it harder to do A/B comparisons.

Talkbox latency

VocalSynth's Talkbox is able to intelligently analyze an incoming audio signal, extracting an accurate map/envelope of the formants without need for the hardware.

With more latency comes more intelligibility but this compromises the ability for live performance. This parameter allows you to toggle between two types of algorithms, one optimized for live performance, and one for studio use, or the final bounce, which increases intelligibility.

The algorithm for studio use has approximately 50 ms of latency at 44.1 kHz. This, coincidentally, is roughly the amount of time it takes all frequencies to pass (a 20 Hz cycle is 50 ms long).

Updates

iZotope may periodically push new builds online featuring bug fixes, host updates, and platform support as required.

VocalSynth can automatically notify you of these as they become available, or if you'd prefer it didn't phone home, you can check manually every once in a while.

Authorization

This displays your current authorization status which is more extensively outlined in the Authorization chapter.

It also allows you to de-authorize if you need to move your license to an additional machine(s).

VOCALSYNTH

How to use VocalSynth in Pro Tools

SETTING UP MIDI MODE

1. Create a MIDI track and an audio track.

2. Ensure audio data exists on the audio track.

3. Insert VocalSynth as a plug-in on the audio track.

4. In the "Output" drop-down menu of the MIDI track, select any MIDI channel you want for VocalSynth.

5. In VocalSynth, enable MIDI mode via the MIDI button.

6. Record-Enable your MIDI track to pop the corks and let the MIDI flow.

SETTING UP SIDE-CHAIN

1. Create two audio tracks.

2. Ensure audio data exists on both tracks. Try vocals on Track 1 and the instrument on Track 2.

3. Insert VocalSynth as a plug-in on Track 1.

4. Enable the Side-chain button to switch VocalSynth's carrier signal from the internal synths to the Side-chain input.

5. Click on the output routing for Track 2, and select Bus 1.

6. On Track 1, in the VocalSynth plug-in shell, select Bus 1 from the Key Input (aka Side-chain) menu. Note: Pro Tools only accepts mono side-chain inputs.

7. Make some sweet, sweet music.

VOCALSYNTH

How to use VocalSynth in Logic Pro

Logic Pro's support for MIDI-controlled effects differs slightly from that of other hosts.

You may insert VocalSynth as an audio effect on an audio track but will not be able to send MIDI information to the plug-in. On an audio track, VocalSynth only supports Auto voice and Side-chain modes.

You may insert VocalSynth as a MIDI-controlled effect on an instrument track to send MIDI information to the internal synthesizers. However, you must use the plug-in's side-chain to route the vocal into the plug-in as the modulator. No second side-chain exists to route in a carrier signal. On an instrument track, VocalSynth only supports Auto voice and MIDI modes.

SETTING UP MIDI MODE

1. Create an instrument track.

2. Insert VocalSynth as a MIDI-controlled audio effect in the instrument slot.

3. Use the Logic Pro plug-in shell to route in an audio side-chain signal as the modulator.

4. Ensure audio data exists on the track you're routing in.

5. In VocalSynth, enable MIDI mode via the MIDI button.

SETTING UP SIDE-CHAIN

1. Create two audio tracks.

2. Ensure audio data exists on both tracks. Try vocals on Track 1 and the instrument on Track 2.

3. Insert VocalSynth as a plug-in on Track 1.

4. Enable the side-chain button to switch VocalSynth's carrier signal from the internal synths to the side-chain input.

5. On Track 1, in the Logic Pro plug-in shell, select Track 2 as the side-chain input.

6. Go crazy.

VOCALSYNTH

How to use VocalSynth in Cubase

SETTING UP MIDI MODE

1. Create an audio track and a MIDI track.
2. Insert VocalSynth as a VST3 *(not VST2)* plug-in on the audio track.
3. In the MIDI track, set VocalSynth as the target.
4. In VocalSynth, enable MIDI mode via the MIDI button.

SETTING UP SIDE-CHAIN

1. Create two audio tracks.
2. Ensure audio data exists on both tracks. Try vocals on Track 1 and the instrument on Track 2.
3. Insert VocalSynth as a VST3 *(not VST2)* plug-in on Track 1.
4. Enable the Sidechain button to switch VocalSynth's carrier signal from the internal synths to the Sidechain input.
5. On Track 2, select VocalSynth as the side-chain in the Send section.
6. Activate the send and set pre/post fader behavior to pre-fader.
7. On Track 2, turn down the master fader so you don't hear the dry audio.
8. Perform a Zapp and Roger cover.

VOCALSYNTH

How to use VocalSynth in Live

SETTING UP MIDI MODE

1. Create a MIDI track and an audio track.

2. Ensure audio data exists on the audio track.

3. Insert VocalSynth as a plug-in on the audio track.

4. In the Output section of the MIDI track:
   a. Switch monitor to IN.
   b. Switch MIDI To to your audio track. This option won't appear unless you've first done Step 3 and inserted VocalSynth on the audio track. Which is why Step 3 is before Step 4.

5. In VocalSynth, enable MIDI mode via the MIDI button.

SETTING UP SIDECHAIN

1. Create two audio tracks.

2. Ensure audio data exists on both tracks. Try vocals on Track 1 and the instrument on Track 2.

3. Insert VocalSynth as a plug-in on Track 1.

4. On Track 2, the instrument, navigate to the 'Audio To' drop-down menu:
   a. Select Track 1.
   b. In the second drop-down menu, select iZotope VocalSynth.

5. Enable the Sidechain button to switch VocalSynth's carrier signal from the internal synths to the Sidechain input.

6. Rock out with VocalSynth.

VOCALSYNTH

How to use VocalSynth in FL Studio

SETTING UP MIDI MODE

1. Set up your MIDI device: You can use your keyboard or create a new Midi Out track if you don't have a controller.

2. Create an audio track and insert VocalSynth by selecting that track in the mixer view and using the inserts located on the right.

3. Click on the Gear icon in the upper left corner of the VocalSynth effect window to show the plug-in settings.

4. Make sure your MIDI port matches the port of your Controller or Midi Out track.

5. In VocalSynth, enable MIDI mode via the MIDI button.

SETTING UP SIDE-CHAIN

1. Create two audio tracks.

2. Ensure audio data exists on both tracks. Try vocals on Track 1 and the instrument on Track 2.

3. Insert VocalSynth as a VST3 *(not VST2)* plug-in on Track 1.

4. Navigate to the plug-in window's processing settings by clicking on the Gear in the upper left corner, then clicking on the processing tab.

5. Enable the Stereo Aux Input, right-click on the grey box and select Side-chain Audio to route the side-chain into the plug-in.

6. Disconnect Track 2's routing to the master fader

7. Enable the side-chain button to switch VocalSynth's carrier signal from the internal synths to the side-chain input.

VOCALSYNTH

How to use VocalSynth in Studio One

SETTING UP MIDI MODE

1. Set up your MIDI device. In Studio One, MIDI devices are disabled by default.

2. Create an audio track and an instrument track.

3. Insert VocalSynth as a VST plug-in on the audio track.

4. On the instrument track, click on the output routing and select VocalSynth.

5. Ensure the track is record-enabled and the speaker icon is blue.

6. In VocalSynth, enable MIDI mode via the MIDI button.

SETTING UP SIDE-CHAIN

1. Create two audio tracks.

2. Ensure audio data exists on both tracks. Try vocals on Track 1 and the instrument on Track 2.

3. Insert VocalSynth as a plug-in on Track 1.

4. In VocalSynth, enable the Side-chain button to switch VocalSynth's carrier signal from the internal synths to the Sidechain input.

5. In Studio One's plug-in shell, click the side-chain button so that it turns blue.

6. In Studio One, click the Mix button to open the mixer.

7. On Track 2, click the Expand button to show the advanced routing settings.

8. Click the + button and add a send to VocalSynth.

9. Toggle the Pre/Post Fader toggle to Pre-Fader (yellow).

10. Turn down the fader for Track 2 so we don't hear the dry signal.

VOCALSYNTH

Authorization

Authorization is required to disable both Trial and Demo modes.

Trial mode

For the 10 days after VocalSynth is first opened or instantiated, VocalSynth will run in Trial mode. Trial mode offers the full functionality of VocalSynth.

Demo mode

After 10 days, VocalSynth will go into Demo mode. In Demo mode, VocalSynth inserts silence at intervals.

Serial number

Each purchased copy of VocalSynth contains a unique serial number to authorize your product.

If VocalSynth has been downloaded directly from iZotope or another reseller, the serial number will be emailed to you, along with the link to download the product. The serial number should resemble:

SN-VSYN-XXXX-XXXX-XXXX-XXXX

Instructions on how to use this serial number to authorize are outlined in this chapter.

AUTHORIZING YOUR COPY OF VOCALSYNTH ONLINE

Launching the Authorization Wizard

The first time you open the VocalSynth plug-in, the Authorization Wizard will appear.

You can choose to either click "Authorize" to authorize VocalSynth, or instead click "Continue to use it in Trial mode" for evaluation purposes. If you've purchased VocalSynth, please use your supplied VocalSynth serial number to fully authorize your product.
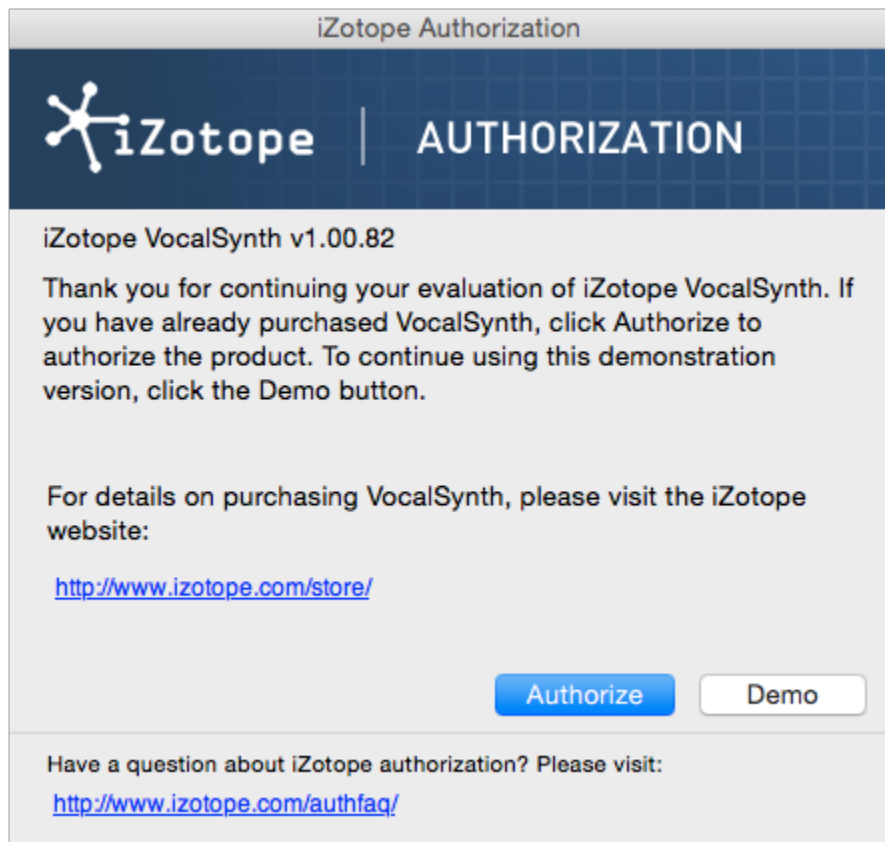
After opening VocalSynth and launching the Authorization Wizard, perform the following steps to complete the authorization process online:

1. Click on "Authorize."

2. Enter the serial number, using all capital letters, as it is shown in the purchase confirmation email. SN-VSYN-XXXX-XXXX-XXXX-XXXX
   a. You must also enter your name and a valid email address.
   b. Note: Clicking the Advanced button reveals a set of options that allow you to store your VocalSynth authorization on a portable hard drive or flash drive. More detail can be found at www.izotope.com/en/support/authorization.

3. Please make note of the email address you use to authorize your license, as your license and iZotope account will be linked directly to this email address.

4. When you have confirmed that your serial number and email information is accurate, click once more on "Authorize."
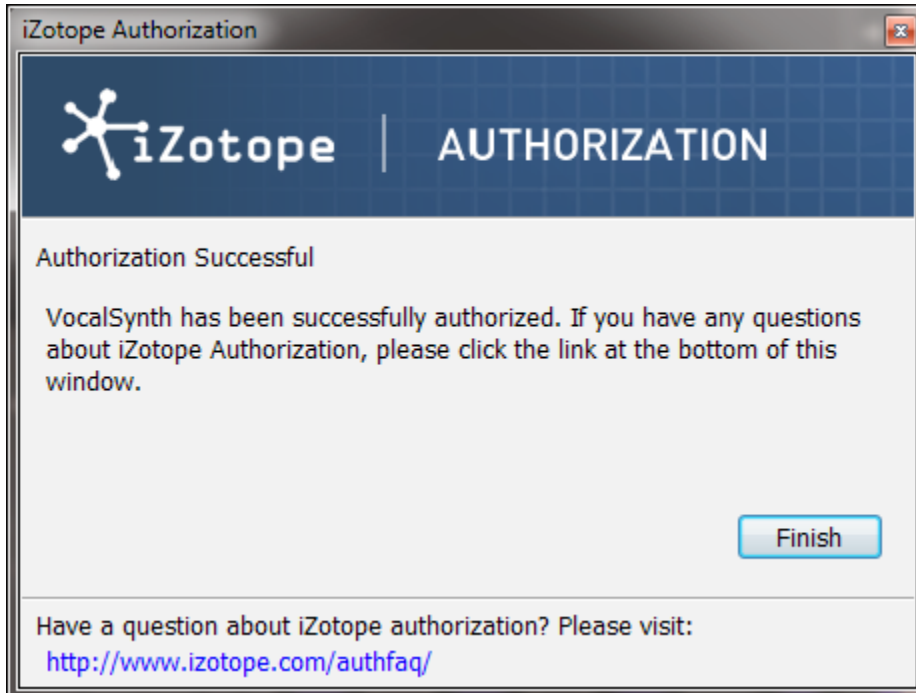
5. Click on "Submit" to send your authorization information to iZotope.

6. Once the authorization is accepted, click on the Finish button to complete the authorization.

AUTHORIZING YOUR COPY OF VOCALSYNTH OFFLINE

Some customers choose to keep their audio workstations offline; for these instances, a simple offline authorization option has been included.

After opening VocalSynth and launching the Authorization Wizard, the following steps will complete the authorization process offline:

1. When first prompted to authorize VocalSynth, click on "Authorize."

2. Click on the option for "Offline Authorization" at the bottom of the authorization window.

3. You will be given a unique Challenge Code that is specific to your computer only.
   a. Write down or make a copy of the exact Challenge Code. It will look like this: IZ-VocalSynth-XXXXXXXX-XXXX-XXXX

4. Next, using a system with Internet access, log in to your customer account at the iZotope website: www.izotope.com/en/account/log-in/.

5. Click on "Activate Software with a Serial Number," enter your full serial number, then click "Submit."

6. Select the "Challenge/Response option and click on "Submit."

7. Enter your full Challenge Code copied in step 3.

8. After submitting your Challenge Code, you will receive a unique authorization file named "iZotope_VocalSynth_xxxxx.izotopelicense." Copy this file to your offline computer.

9. Once the authorization file is copied to your offline computer using a network, hard drive, or USB thumb drive, click the Choose File... button in your authorization wizard.

10. Navigate and select the authorization file and click "Next" to authorize your machine.

11. You should now receive a message that your authorization has been successful; you may click "Finish" to begin using VocalSynth.

ILOK SUPPORT

VocalSynth supports the iLok copy protection system.

The plug-in will be able to detect iLok keys and assets if you already use iLok and PACE software on your system.

If you don't already have PACE or iLok, we will not install any PACE or iLok software to your system, and iLok authorizations will be unavailable.

Authorizing VocalSynth with iLok

1. When first prompted to authorize VocalSynth, click on "Authorize."

2. Next, enter the serial number in all capital letters as it is shown on the included card or purchase confirmation email.
   a. This would look something like: SN-VSYN-XXXX-XXXX-XXXX-XXXX

3. You must also enter your name and a valid email address. Make note of the email address you use to authorize your license. Your license and iZotope account will be linked directly to this email address.

4. Select "Use iLok Authorization" and enter your iLok ID.

5. When you have confirmed that all your information is accurate, click once more on "Authorize."

6. Lastly, click on "Submit" in order to send your authorization message to the iZotope servers.

7. You will now be instructed to log in to your iLok account and transfer your VocalSynth license to your iLok.

8. When you have completed this step and have your iLok connected to the computer on which you want to use VocalSynth, click "Next."

9. You should now receive a message that your authorization has been successful and may click "Finish" to begin using VocalSynth.

REMOVING YOUR CURRENT AUTHORIZATION

If you need to move your license to an additional machine(s), use the Remove Authorization button in the VocalSynth's Options menu to remove your current VocalSynth authorization.

After removing your authorization, VocalSynth's authorization screen will pop up when you restart the program. Now you can re-authorize using a new serial number. You may also remove your authorization at any time in order to run in Trial or Demo mode.

HOW TO CONTACT IZOTOPE CUSTOMER CARE

For additional help with authorizing VocalSynth:

- Check out the Customer Care pages on our web site at www.izotope.com/support.

- Contact our Customer Care department at support@izotope.com.

More information on iZotope's Customer Care department and policies can be found in the iZotope Customer Care section.

VOCALSYNTH
iZotope Customer Care

HOW TO PURCHASE THE FULL VERSION OF VOCALSYNTH

If you are using the Demo version of VocalSynth and would like the full version, you can purchase VocalSynth direct from the iZotope online store, located at: www.izotope.com/store.

Once your purchase is complete, you will be sent an email confirmation and a full-version serial number that can be used to fully authorize your current installation of VocalSynth.

IZOTOPE CUSTOMER CARE POLICY

iZotope is happy to provide professional technical customer support to all registered users. We also offer valuable pre-sales support to customers who may be interested in purchasing an iZotope product.

For details, please see our **Product Support Policy**.

Before contacting iZotope's Customer Care team, you can search our **Product Knowledgebase** to see if the solution to your problem has already been published.

HOW TO CONTACT IZOTOPE CUSTOMER CARE FOR TECHNICAL SUPPORT

For additional help with VocalSynth:

- Check out the Customer Care pages on our web site at
  www.izotope.com/support.

- Contact our Customer Care department at https://support.izotope.com/.

iZotope's highly trained Customer Care team is committed to responding to all requests within one (1) business day and frequently responds faster. Please try to explain your problem with as much detail and clarity as possible. This will ensure our ability to solve your problem accurately, the first time around. Please include all system specs and the build/version of VocalSynth that you are using.

Once your Customer Care request is submitted, you should automatically receive a confirmation email from iZotope Customer Care. If you do not receive this email within a few minutes please check your spam folder and make sure our responses are not getting blocked. To prevent this from happening, please add support@izotope.com to your list of allowed email addresses.

INTERNATIONAL DISTRIBUTION

Customer Care is also available from our international distributors worldwide, for any customers who purchased their iZotope products through a certified iZotope distributor.

Check with your local distributor for their availability. If you would like help locating your local distributor, please contact iZotope Customer Care.

VOCALSYNTH

FAQ/ Troubleshooting

Here are some quick answers. For additional help with VocalSynth:

- Check out the Customer Care pages on our web site at www.izotope.com/support.

- Contact our Customer Care department via https://support.izotope.com/.

WHY AM I NOT HEARING ANY AUDIO?

1. If the Wave-meter is displaying audio, the problem isn't VocalSynth.

2. Mix in some Dry signal with the Global Dry/Wet control. If you don't hear anything, the problem isn't VocalSynth.

3. Mix in some Dry signal with the Global Dry/Wet control. If you hear Dry signal, but not Wet, try the following:

    a. Ensure the Polyvox/Vocoder/Compuvox/Talkbox are enabled.

    b. Ensure the Gain faders in the Voices mixer are up.

    c. Is MIDI mode enabled? Check that MIDI signal is present.

    d. Is Auto mode enabled? Check that the Gain knobs of the Auto voices are up.

    e. Is Sidechain mode enabled? Check that Sidechain audio is correctly bussed into the plug-in.

WHY IS THERE HIGH LATENCY WHEN PERFORMING LIVE?

1. Is the Talkbox on? If so:

    a. Open the Options menu.

    b. Enable Low Latency Talkbox for live performance.

    c. Disable Low Latency Talkbox for higher-quality results when mixing.

VOCALSYNTH'S CPU USAGE IS TOO HIGH. HELP!

VocalSynth's processors are designed to be used one-two times per session. To optimize CPU usage:

1. Open the Options menu.

2. Enable True Bypass.

3. Disable any modules or effects not in use.

4. In your DAW, try increasing the buffer size.

5. Once you've dialled in your sound, use your DAW's Track Freeze feature.

VOCALSYNTH IS TOO MUCH AWESOME.
I CAN'T HANDLE IT. HELP!

1. #sorrynotsorry

2. No, but seriously, we genuinely appreciate your feedback and would love to hear from you via Customer Care. Please don't be shy!

VOCALSYNTH

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