VOICETONE™ synth
PRODUCT MANUAL

ENGLISH VERSION

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Introduction

Welcome to VoiceTone Synth

VoiceTone Synth was designed to meet the demands of all genres of singing artists for a portable, high quality vocoder and HardTune pitch shifting effect with exciting new sonic possibilities.

VoiceTone Synth presents a selection of 10 professionally authored presets. When out-of-the-box sounds aren't enough, Synth provides editing controls to customize the presets to your preference.

Product information is updated regularly, so be sure to check www.tc-helicon.com for the latest news.

Features:

o HardTune processor with options for octave shift and gender processing.

o Vocoder effect with options for an external carrier input or various onboard synthesizer flavors.

o Transducer effects to create megaphones and distortions in series with HardTune and Vocoder.

o Tone processing with adaptive compression, Shape EQ and de-ess.

o Clean, studio quality mic preamp with phantom power.

o 10 user editable presets with footswitch selection.

o XLR mono output with separate, dry-only output.

o USB Connectivity for updates, back-up and more

About TC-Helicon

At TC-Helicon we truly believe that the voice is the world's most beautiful instrument. We don't mean to degrade other beautiful instruments, but the singing voice is the anthropological source for all things melodic.

You should know there is a dedicated group of engineers, researchers and product specialists based in Victoria BC, Canada, who spend every waking moment of their working lives listening, talking, singing, and interacting with singers and those who have passion for the singing voice.

All this knowledge and experience is used to design products respecting and empowering the modern vocalist. Our products focus on removing barriers and inspiring creativity in performance. That's why our products range from near-field personal vocal monitors to floor-based vocal multi-effects pedals.

Enjoy!

The TC-Helicon Team
a TC Group company

Quick Start

Step 1:
Connect your microphone to a mic cable.

Step 2:
Connect the mic cable to the Mic Input on Synth.

NOTE:

Make sure Synth is not powered at this time.

Quick Start
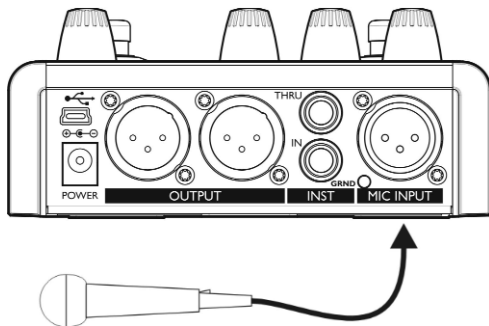
Step 3:
While you're connecting and setting up, lower the fader on your mixer channel to off. Connect a mic cable from the Mono Out to a mic input on your sound system.
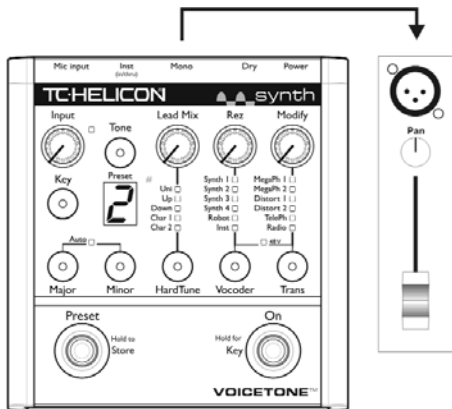
Step 4:
Connect a 1/4'' cable from your guitar or instrument to to the Inst in. Connect the Thru to your amp, if you want your guitar or instrument sound passed unprocessed to your amp.
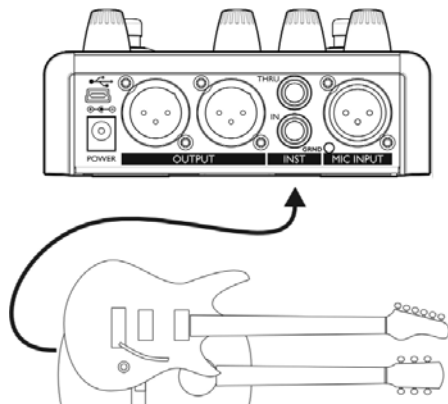
Quick Start

Step 5:

Set the Input Knob fully left.

Step 6:

Connect Synth's power adapter to main power and to the Power Input on Synth. There is no power switch so plugging it in automatically turns Synth on.
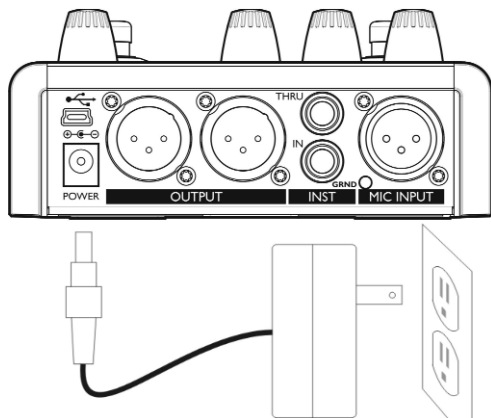
Step 7:

While singing through your microphone, raise the Input Knob until the Input Light turns green, sometimes orange on louder parts, but never red.

Step 8:

For your first listen, check that the LEDs conform to the status shown in the boxes below. Press the button associated with the LEDs to change them if necessary. Select preset 1 or 2 with the Preset footswitch.
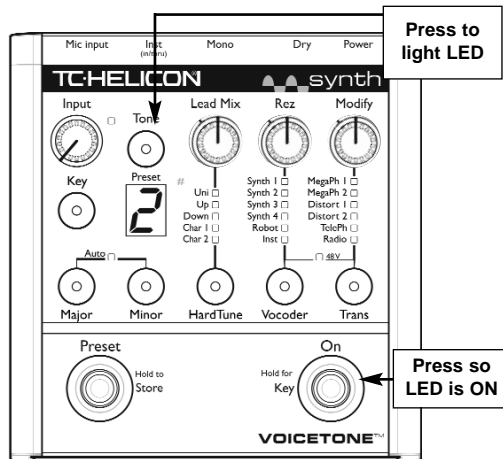
Quick Start

Step 9:
Slowly raise the fader on your mixer channel as you sing into your mic. Once you've reached a comfortable listening level you should hear your voice through the HardTune or Vocoder sound in preset 1 or 2 respectively.

Now you're ready to hear Synth's effects. If Vocoder is turned on and set to Inst, you'll need to connect an instrument or audio device to the Inst input.

VoiceTone Synth is great for experimentation. Forget everything you've learned about singing and focus on being creative. Don't be scared to sing, talk, and make noises when you vocalize.

Make sure to install the VoiceSupport application. It keeps VoiceTone Synth up to date with the latest software as well as tips and tricks on using the product.

Visit www.tc-helicon.com/support if you need support.

Setup: Singer Only

Connections
Connect your mic to the Mic Input. If you're using a condenser mic, press and hold the Vocoder & Trans buttons to enable +48V phantom power. Connect the Mono Out to a PA.

Getting the HardTune Effect
Select preset 1 which has only HardTune enabled. Select the key of your song by pressing the Key button. Choose Major or Minor for the scale type.

Getting Vocoder Effects
Select a preset that only has Vocoder enabled with Synth 1 to 4 or Robot selected. These presets use the internal synth with your voice. Select the key of your song by pressing the Key button. Choose Major or Minor as the scale type.

TIP: for more styles of vocoding try varying the REZ control, and see Advanced HardTune & Vocoder Style Select in the For Advanced Users section.

Setup: Singing Electronic Artist

Connections
Connect your mic to the Mic Input. If you're using a condenser mic, press and hold the Vocoder & Trans buttons to enable +48V. In additon you need to connect an instrument or audio source to the Inst in. Connect the Mono Out to a PA.

Getting the HardTune Effect
Select preset 1 which has only HardTune enabled. If there is polyphonic audio coming from your keyboard or instrument, then select Auto by pressing and holding the Major and Minor buttons. With Auto key and scale, the HardTune effect will follow your music.

Vocoding Your Instrument
Select preset 0 that has Vocoder enabled. Vocalize through your microphone while audio is being played back from your instrument.

For more styles see Advanced HardTune & Vocoder Style Select in For Advanced Users section.
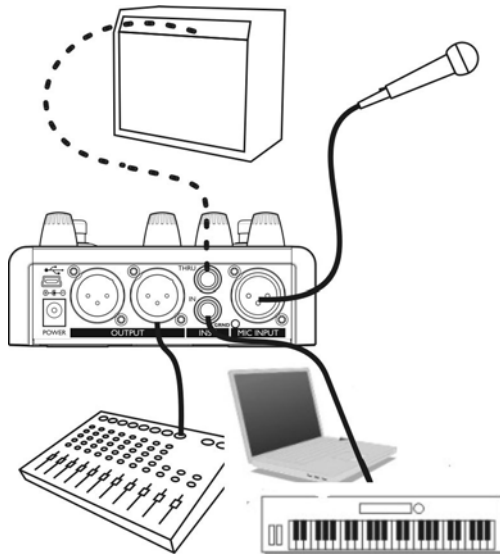
Connections
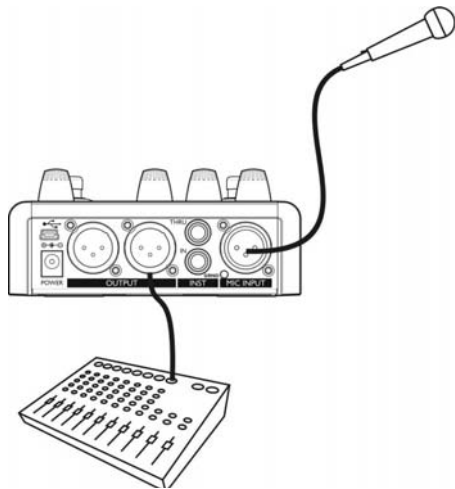
Connect your mic to the Mic Input. If you're using a condenser mic, press and hold the Vocoder & Trans buttons to enable +48V phantom power. In addition you need to connect your guitar to the Inst in. Connect the Mono Out to a PA.

Getting the HardTune Effect

Select preset 1 that has only HardTune enabled. If you're playing chords on your guitar, then select Auto by pressing and holding the Major and Minor buttons. With Auto key and scale, the HardTune effect will follow your guitar chords.

Vocoding Your Guitar

Select a preset that has Vocoder enabled and select Inst as the style. Vocalize through your microphone while playing your guitar.

For more styles see Advanced HardTune & Vocoder Style Select in the For Advanced Users section.
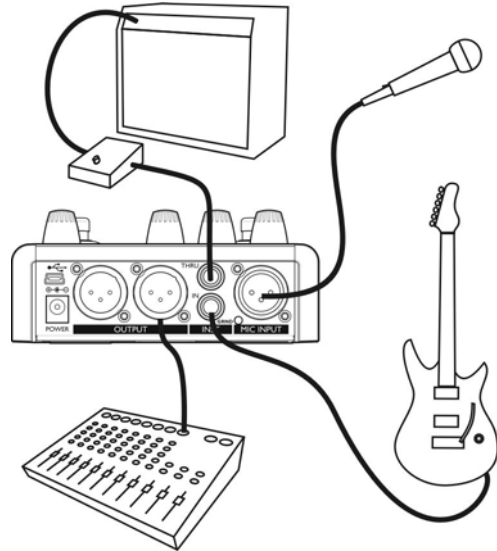
Front Panel
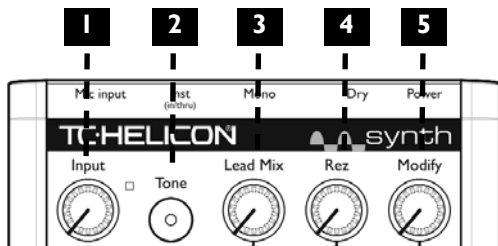
1. Input Knob and LED
Adjust the Input Knob so that while you sing, the LED beside it flashes green, sometimes orange but never red.

2. Tone Button
This engages TC-Helicon's Live Engineer Effects which automatically modifies your voice and makes it sound smoother and brighter. When engaged, these effects remain active whether the On button is active or not.

3. Lead Mix Knob
Lead Mix controls the mix of the HardTune and Vocoder effects. 12 o'clock is the default position for any combination of these effects. Turning the knob right boosts the effect. When two effects are on, the knob controls the mix between the two.

4. Rez Knob
Modifies the vocoder effect by controlling the number of filters or poles applied to the vocoder. This has the effect of modifying intelligibility in a musically useful way.

5. Modify Knob
This control gives additional sonic flexibility to the Transducer effects. Each effect has its own assignment of parameters controlled by the Modify knob.

Note: The Lead Mix, Rez and Modify parameters are stored with the preset. Changing them only affects the current preset.
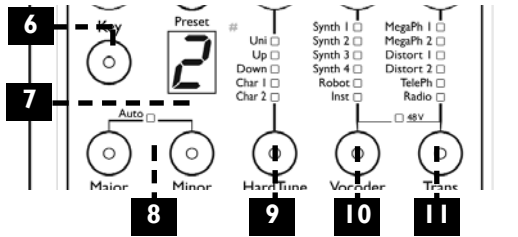
6. Key Select Button
This allows you to define a fixed key instead of auto-sensing a connected instrument to control the HardTune and Vocoder effects. Press the Key button to cycle through the 12 keys (C, C#, D... B). Sharp keys, e.g. C# are shown by a dot in the lower right of the display.

7. Preset/Key Display
Shows the current preset number. When the Key or Major/Minor buttons are pressed, the display will momentarily change to show the current key and then change back to the preset number. When the Lead Mix, Rez

or Modify knobs are turned, this briefly displays their numerical value.

8. Major / Minor Buttons and Auto LED
The scale type may be Major, Minor or Chromatic (no key). Hold both buttons for a moment to enter Auto mode where musical information is derived from the Inst input. Turn off both Major and Minor to enter Chromatic mode.

9. HardTune Button and LEDs
Press to choose HardTune effects: Uni(son), Octave Up and Down, Character effects and off (no LED lit).

10. Vocoder Button and LEDs
Press to select a Vocoder option shown above the button and to turn the effect off (no LED). The Synth and Robot options require either a key and scale to be set or Auto on and an instrument playing. Inst requires an external instrument for vocoding and will flash until an instrument is connected to the Inst in.

Front Panel
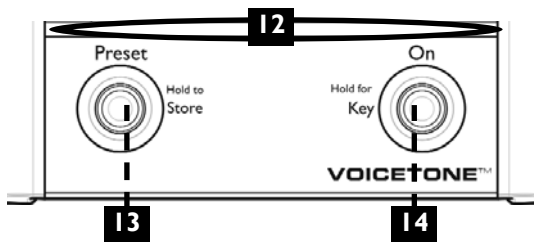
11. Transducer Button and LEDs

Press to select Transducer options or effect off.

12. LED Indicator Bar

This translucent bar indicates the status of the On footswitch and lights the location of the Preset footswitch. The Preset LED will flash on a Store operation. Both LEDs flashing indicates Key Set mode.

13. Preset Select Footswitch

Tapping this footswitch will cycle forward through the 10 presets. Holding will store the current status of all effect values to the current preset number.

14. On Footswitch

Use the On footswitch to toggle the current preset's effects on and off. If Tone is on, its effects remain active whether the On button is lit or not.

You can hold the On footswitch to set the key for the HardTune and Synth effects from a standing position. The On and Preset LEDs will flash. VoiceTone Synth can recognize simple major or minor chords played on an instrument connected to the Inst input or you can tap the On and Preset buttons to cycle through Key and Major/Minor options respectively. Hold the On footswitch to exit Key Set mode when you're done.

the preamplified Mic Input signal if needed for external mixing.

4. Instrument In and Thru Connections

Connect an instrument here to provide the vocoder carrier signal ("Inst" input only). A chordal instrument connected here such as a guitar can also set key and scale for the HardTune and Vocoder's Synth and Robot effects. This input is high impedance to accept single coil guitar pickups. Plug a 1/4" cable from the Thru jack to your first effect pedal or to your amplifier/PA.

1. USB connector

Connects Synth to your computer for backup, restore and editing of presets (install VoiceSupport from CD).

2. Power Input

Connecting the power adaptor turns the unit on.

5. Guitar Ground Lift

Push in to overcome buzzing that may occur when the Thru jack connects to a different amplifier/PA than the Mono Out. Leave out when Thru is not connected.

3. Outputs

The output of Synth is mono only. Connect this to a mic or line input of your PA system. The Dry output passes

6. Mic Input

Connect your mic here. When Vocoder is on, this input is the modulator.

Using VoiceTone Synth

Loading Presets
Press the Preset button to load the next preset. The numeric display will show the next number. Pressing repeatedly will loop through all 10 presets (where 10 is displayed as 0).

Understanding the Presets
Presets are comprised of combinations of the HardTune, Vocoder or Transducer effects and their respective control knobs. The buttons for each effect have LEDs to show which are active and then a row of LEDs above to show which effect option is active.

If Transducer is the only effect LED lit, you only need to turn the effect on with the On footswitch and vocalize. When the HardTune and/or Vocoder effect LEDs are lit in a preset, they require specific input from you to work correctly and this is discussed in the following paragraphs.

Creating HardTune Effects
The HardTune effect quickly and un-naturally shifts the pitch of your voice to the nearest scale tone while you sing. This is the desired effect. It is important for the scale tones to relate musically to your songs. In version 1.1 of Synth, HardTune may also be used for "natural" correction. Please see the Advanced HardTune & Vocoder Style Select section.

To choose HardTune scale tones that relate musically to your song pick one of the following:

1. Auto LED on: Play any chordal instrument such as a guitar to the Inst in jack. Synth will derive ongoing scale tones from the chords you play and tune your vocal pitch accordingly. You will hear your instrument only if a cable is connected to an amp or PA system from the Thru connection.

2. Auto LED off: Input a fixed key and scale e.g. C Major using the Key button and the Major/Minor

buttons. Your voice will be tuned to the scale tones of the key you've selected. Alternatively, you can use a chromatic scale which does not require a key by turning off both the Major and Minor LEDs.

Method #1 (Auto) is the simplest to use and will remain musically relevant as you change from song to song. You can use method #2 (fixed key and scale and chromatic) if you do not play a musical instrument or you simply want to alternate between the two methods for a different sound.

Note that with fixed key and scale, you will have to set the key for every song in which you plan to use the HardTune effect unless you use the chromatic scale.

To change a preset to Auto, hold both the Major and Minor buttons for a moment so that the Auto LED turns on. To change a preset from Auto to fixed key and scale, tap either of the Major, Minor or Key buttons or hold the On footswitch. This can be stored with each preset by holding the Preset footswitch.

To create the HardTune effect:
1. Find a preset with only the HardTune button lit.
2. Choose Auto, fixed key and scale, or chromatic and set accordingly.
3. Activate the On footswitch.
4. Sing while you play your instrument (Auto on) or sing in the key you've set.

Repeatedly tap the HardTune button to cycle through the options and effect off. See the For Advanced Users section for information on more options. The basic HardTune options are described below.

Uni - Your voice remains in the same octave in which you sing but your notes are HardTuned.

Up - Your voice is shifted one octave up and HardTuned.

Down - Your voice is shifted one octave down and HardTuned.

Char 1 - Lower gender is added to your voice in addition to HardTune.

Using VoiceTone Synth

Char 2 - Higher gender is added to your voice in addition to HardTune.

Using the Lead Mix Control
The Lead Mix control allows you to boost the effects or mix in more lead voice with HardTune or Vocoder.

When HardTune and Vocoder are on simultaneously it controls the mix between the two effects

The value can be stored at a different value in each preset if desired. Note that the position of the knob does not always represent the Lead Voice value in the preset. You can see and edit the current value in the Preset numeric display when you've turned the control far enough in either direction to pass through its value.

Vocoder Basics and Terminology
The classic vocoder effect could be described as an instrument that sounds like it's talking. To create a vocoder effect you need two audio sources; the "carrier" and the "modulator". You can think of the carrier as your vocal cords creating a buzzy noise and the modulator as your mouth forming to pronounce words.

In VoiceTone Synth, the carrier can be an external instrument such as a guitar, synthesizer, fully mixed tracks, etc. With no instrument connected, Synth's onboard synthesizer has been specially configured to create interesting vocoder sounds with your voice alone.

The modulator in VoiceTone Synth enters through the Mic input. While this is most often your voice, you can try any sound with a varying cadence to see how it will sound.

Creating Vocoder Effects with Your Instrument
The classic vocoder effect using your instrument as the carrier is created when the Vocoder effect has the Inst option lit. All other Vocoder options engage VoiceTone Synth's internal synthesizer.

To make a vocoder effect with your instrument as carrier:
1. Connect any instrument to the Inst input.
2. Find a preset with the Vocoder button on and its option set to Inst.
3. Activate the On footswitch.
4. Vocalize while you play the instrument.

Note that you will only produce an audible effect when you are vocalizing and playing your instrument. You don't have to sing melodies to produce an effect with the Vocoder Inst option; you only need to make vowel sounds if you prefer.

Creating Vocoder Effects with the Onboard Synth

If you want an alternative to the Inst input you can engage the onboard synthesizer. The onboard synth needs musical guidance from you and, as such, uses the Auto or fixed key and scale parameters. These parameters are described previously in the HardTune description. HardTune does not need to be on.

To produce a vocoder effect with the onboard synthesizer:
1. Find a preset with Vocoder on and its option set to Synth or Robot (but not Inst).
2. Activate the On footswitch.
3. Set Auto to on and play the instrument connected to the Inst input while you sing.
OR
3. Turn Auto off and either set a fixed key and scale or use the chromatic scale.

Tap the Vocoder button to cycle through the options and off. On each option you can hold the Vocoder button to enter a variation selection mode. See the For Advanced Users section for more detail.

Vocoder Synth Sound Descriptions

Synth 1 to 4: these are a mixture of synth sounds, some monophonic, some polyphonic. See the Presets and Style Description tables at the end of this manual for more detail.

Using VoiceTone Synth

Robot: the onboard synth produces a monotone note fixed to either the the root of the chord you play (Auto on) or the scale root e.g. the "C" in C Major (Auto off).

Inst: the instrument connected to the Inst input is the carrier.

TIP: to get more vocoder sounds see the Advanced HardTune and Vocoder Style Select section under For Advanced Users.

Using the Rez Control
This control modifies the vocoder effects below it by controlling the number of filters or poles applied to the vocoder. This has the effect of modifying intelligibility in a musically useful way. Turn the control while you vocalize to hear the changes. This can be stored at a different value in each preset if desired. Note that the position of the knob does not always represent the Rez value in the preset. You can see and edit the current Rez value in the Preset numeric display when you've turned the control

far enough in either direction to pass through and pick-up its value.

Creating Transducer Effects
The Transducer block adds distortion and band limiting effects such as megaphone and radio to your voice.

To create Transducer effects
1. Find a preset with the Transducer button on and any option lit.
2. Activate the On footswitch.
3. Vocalize or sing.

Tap the Transducer button to cycle through the options and off.

Using the Modify Control
This control gives you a range of sounds for the Transducer effect. Each option has its own combination of parameters assigned to the Modify control. Turn the control while you sing to hear the changes. This can be

stored at a different value in each preset if desired. Note that the position of the knob does not always represent the Modify value in the preset. You can see and edit the current Modify value in the Preset numeric display when you've turned the control far enough in either direction to pass through and pick-up its value.

Transducer Styles & Modify Controls

MegaPh1 - Megaphone sound with distortion. The Modify control varies the distortion amount.

MegaPh2 - Megaphone effect without distortion. The Modify control adjusts a HiCut filter.

Distort1 - Medium distortion sound. The Modify control changes the distortion amount.

Distort2 - Heavy overdrive distortion. The Modify control changes the distortion amount.

TelePh - Emulates telephone bandwidth. The Modify control adjusts a HiCut filter.

Radio - Emulates the bandwidth and distortion of an old radio. The Modify control adjusts a LoCut filter.

For Advanced Users

Choosing Alternate Tone Settings

The factory default for the Tone button accommodates a wide range of singers but there are options to further customize this feature.

To access the alternate tone settings, hold the Tone button until you see the Preset number display flash. You can tap the Tone button to cycle through the numbered choices shown below:

- d: Default setting. Best for most situations.
- 1: Best if you have a very bright sounding PA.
- 2: This option adds "warmth" to your voice.
- 3: Increased compression. Caution: this increases the likelihood of feedback.
- 4: Default setting plus a -50dB threshold gate on Transducer to help reduce feedback.
- 5: Default setting plus a -40dB threshold gate on Transducer to help reduce feedback.
- 6: Default setting plus a -30dB threshold gate on Transducer to help reduce feedback.

Advanced HardTune & Vocoder Style Select

Each HardTune and Vocoder style (Uni, Up, Synth, Robot, respectively) have additional selections. For example, to browse additional Synth 1 sounds, cycle the Vocoder button to the Synth 1 style, then hold the Vocoder button (Vocoder LED will flash). Tap the Vocoder button to sample the options that are numbered in the preset display. Once you've found one you like, press and hold the Vocoder button to exit. Hold the Preset footswitch to store if desired. Note that cycling through the Vocoder styles again with the Vocoder button will return your edit to the default style (#1) in each style bank.

This functionality is the same for HardTune, except that you would hold the HardTune button to enter and exit the style select mode. In firmware version 1.1 onward, the alternate selections in HardTune impose natural pitch correction values on the respective style. For example, the alternate HardTune Down style retains the octave down pitch shift while softening the effect of the pitch correction.

Performing a Factory Reset

A reset will delete all of your edited presets and return all settings to the factory defaults. To reset the unit, insert the power connector while holding the Major and Trans buttons.

Changing the Tuning Reference

By default, Synth is tuned to A=440 Hz and the HardTune and Synth effects will sound in tune when you sing with instruments tuned to A=440. If you will be singing with an instrument tuned to a different reference e.g. a piano that has dropped in overall pitch, you can change Synth's reference with the following procedure.

Press and hold the Major, Minor and HardTune buttons simultaneously as you plug in the power connector. Then place your microphone near the instrument you want to tune to and play any single note from it. Press any button to return to normal functionality.

Note that the tuning reference is not stored. It will be reset to A440 when the power is disconnected.

Changing the Number of Presets

The default configuration of Synth is to offer 10 presets. You can access less presets for faster access when switching through presets by doing the following.

To set the accessible number of presets, power up holding the Key button. After a moment, the numeric display will show the default number of presets. Tap the Key button to change the limit to up to ten (shown as "0") or back down to two (one is not an option). Hold the Key button to store this setting and exit to normal operation.

MIDI patch change and channel select over USB

From firmward version 1.1 onward, you are able to change presets remotely with a computer by sending MIDI patch change messages over USB. The default MIDI channel is set to 1 but you can choose any other

For Advanced Users

channel up to 16 by sending a system exclusive (sysex) command from your MIDI application.

To change presets on MIDI channel 1 via USB/MIDI:
1. Assemble the required components: Computer with USB, Synth, USB cable, MIDI application e.g. Cubase, Logic, MIDI Ox etc.
2. Connect the USB cable between your computer and VoiceTone Synth.
3. Run the MIDI application and confirm Synth is selected as a MIDI output device in a track and that the track is set to transmit on MIDI channel 1.
4. Select a preset number from 1 to 10 with the controls of the track so that it is transmitted to Synth.

To change the MIDI receive channel on Synth:
1. You will need a computer application capable of editing and sending MIDI system exclusive messages.

2. Copy and paste the following text, known as a sysex string, into the sysex entry line in your application:

   F0 00 01 38 00 58 22 00 0D 00 00 00 **CC** F7
3. Where the letters CC are in the string enter the MIDI channel you would like Synth to receive according to the following Hex table. Note that 0 is zero, not the letter O.
   1=01, 2=02, 3=03, 4=04, 5=05, 6=06, 7=07, 8=08, 9=09, 10=0A, 11=0B, 12=0C, 13=0D, 14=0E, 15=0F, 16=10.
4. Send this string to Synth via the application.
5. Configure the track sending the program change message to transmit on the channel you have just selected.

The receive channel remains during power cycles so you don't have to send it every time you power up.

I can't hear any audio coming out of the product

- o Confirm you have power and a working mic by singing through the mic and confirming that Input LED flashes green, and sometimes orange.
- o If Vocoder is turned on and set to Inst, there must be audio coming from your instrument at the same time you are vocalizing through the product.
- o Confirm the Mono Out is connected to a PA.

I hear distortion

- o Check the input LED, if it is flashing red, then turn down the input volume.
- o Is Transducer enabled? If so, the distortion may be part of that style.

I can't hear any effect

- o Make sure the On LED is lit.
- o Ensure that at least one of the three effects is activate.
- o If Vocoder is turned on, and Inst is selected, make

sure there is audio coming from you instrument. Try turning up your instrument level if the problem persists.

The effects sound out-of-tune

- o Try using a fixed key and scale.
- o Make sure your instrument/tracks are tuned to A440.
- o If you're using Auto mode, turn up the level of the instrument/source.

I'm using a Distortion style, but can't hear it

- o Raise your input level so the Input LED is flashing orange.

My Instrument doesn't seem to change the key of the effects

- o Confirm Auto key and scale is selected.
- o Confirm Vocoder with a Synth sound is selected, or HardTune is on.
- o Remove any guitar effect pedals between your

FAQ and Troubleshooting

guitar and Synth's input.

o Ensure that the audio coming to the instrument input is made up of at least a root note and a major or minor third.

I want to talk to the audience with no FX on, how do I do that?

o Turn the effect off with the On footswitch.

Where can I find support for this product?

o Install the VoiceSupport application or visit www.tc-helicon.com/support

Guitar Performance Tips

o To ensure that the HardTune and Synth effects follow your playing, it's best to play as cleanly as you can. Also, at the beginning of your song, it's important to play a chord if you want to sing right at the beginning.

o Your guitar should be well-tuned to the onboard tuner or an external one set to A=440 Hz.

I'm turning knobs but nothing is happening

o Simply twist a knob from left to right until it catches the stored value and then make your edit.
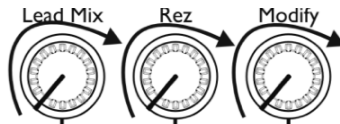
Preset	Name	Key	HardTune	Vocoder	Transducer
1	HardTune	Auto On	Unison 1		
2	Synth 1	Auto On		Synth 1 style 4	
3	Octaveup HardTune+Robot	Auto On	Up 1	Robot style 4	
4	Octave down Synth	Auto On		Synth 2 style 4	
5	Drone Robot	C Major		Robot style 2	
6	HardTune Megaphone	Auto On	Unison 1		Megaphone 1
7	Distorted HardTune Synth	Auto On	Unison 1	Synth 4 style 1	Distort 1
8	Synth Three	Auto On		Synth 3 style 6	
9	Oct HardTune + Vocoder	Auto On	Down 1	Inst style 5	
10	Vocoder	Auto On		Inst style 5	

HardTune	1	2
Unison	Hard	Soft
Up (Octave up HardTune)	"	"
Down (Octave Down HardTune)	"	"
Char 1 (Male gender unison HardTune)	"	"
Char 2 (Female gender unison HardTune)	"	"

Megaphone	Description	Modify Control
Megaph 1	Bandpass filter	Distortion
Megaph 2	Highpass filter	"
Distort 1	Distortion style 1	"
Distort 2	Distortion style 2	"
TelePh	Variable frequency highpass filter	Highpass frequency
Radio	Fixed highpass, variable frequency lowpass filter	Lowpass frequency

Presets and Style Descriptions

Vocoder	Description
	Synth 1 - Mono Synths
1	Unison octave synth 1 wave
2	Unison octave synth 1 wave and female gender
3	Unison octave synth wave 2
4	Unison octave synth wave 3
5	Unison octave synth wave 4 with male gender
	Synth 2 - Bass Synths
1	Octave down synth wave 4
2	Octave down synth wave 4 with male gender
3	Octave down synth wave 2 with male gender
4	Two octaves down synth wave 2
5	Two octaves down synth wave 2
6	Two octaves down synth wave 4
	Synth 3 - Poly Synths
1	Unison+fifth up wave 5
2	Unison+fifth up wave 5 with bass gender
3	Unison+fifth up wave 5, female gender
4	Unison+fifth+9th wave 6
5	Unison+fifth up wave 7 with female gender
6	Octave down modulating wave 8

Vocoder	Description
	Synth 4 - SciFi Synths
1	Wave 9 unison octave
2	Wave 9 female gender
3	Wave 10 three octaves down
	Robot
1	Root note unison octave wave 1
2	Octave down root note + fourth below wave 5
3	Unison root note + fifth above wave 5
4	Unison root note modulated wave 8
5	Wave 9 octave down root note
6	Octave down root note wave 2 with male gender
7	Octave down root note wave 3 with male gender
	Instrument - Vocoder
1	Vocoder with full instrument dynamics and low boost
2	Same as #1 with female gender
3	Same as #1 and male gender
4	Same as #1 with no low boost
5	Vocoder with smooth instrument dynamics
6	Same as #5 and female gender
7	Same as #5 and male gender
8	Same as #5 with no low boost

Specifications

Analog Inputs
- Mic Connector Balanced XLR, Input Impedance 1kOhm
- Mic Input Sensitivity @ 0dBFS -44dBu to +2dBu
- Mic Input Sensitivity @ 12dB headroom -56dBu to -10dBu
- Inst In Connector Unbalanced 1/4'', Input Impedance 1MOhm
- Inst In Sensitivity +15dBu @ 0dBFS
- EIN -126dBu @ max. mic amp gain, Rg = 150 Ohm

Analog Outputs
- Main Output Connectors Balanced XLR
- Output Impedance 40 Ohm
- Output Level +2dBu @ 0dBFS
- Inst Thru Connector Unbalanced 1/4'' Phone Jack
- Inst Thru Output Impedance 270 Ohm

Input to Output Analog Audio Performance
- Dynamic Range, Mic. @ Min gain >108dB, 20 Hz - 20kHz *A-weighted
- Dynamic Range, Mic. @ -18dBu sensitivity > 104dB, 20hz - 20kHz*
- THD+ Noise, Mic. @ Min gain <-90dB
- Frequency Response, max gain -1.5dB @ 40 Hz, +0/-0.3 dB (200Hz to 20 kHz)
- Inst In to Thru Dynamic Range >119dB
- Tuning Mute Attenuation >100dB

Conversion Characteristics
- Sample Rate 48 kHz, Converter AKM AK4620B
- AD / DA Conversion 24 bit, 128x oversampling bitstream

EMC & Safety
- Complies with EN 55103-1 and EN 55103-2 FCC part 15, Class B, CISPR 22, Class B
- Certified to IEC 65, EN 60065, UL6500 and CSA E60065 CSA FILE #LR108093

Environment
- Operating Temperature 32° F to 122° F (0° C to 50° C)
- Storage Temperature -22° F to 167° F (-30° C to 70° C)
- Humidity Max. 90 % non-condensing

Supplementary
- Dimensions 130mm x 132mm x 41mm (5" x 5.25" x 1.5")
- Weight 1.5 lb. (0.72 kg)
- Warranty Parts and labor 1 year

All specifications and features subject to change without notice.