waldorf



USER MANUAL

STVC

Table Of Contents

Foreword **3**
Control Features & Connections **5**
Front Panel 5
Rear Panel Connections 6
Introduction **7**
General Safety Guidelines **8**
Setup and Connections **10**
Setup 10
Connections 10
The Rear Panel Connections 12
Basic Controls **14**
Switching On / Off 14
Master Volume 14
Playing and Selecting Sounds 14
Editing Sounds 15
Saving Sounds 15
The Control Panel **16**
The Wheel Section 16
The Keyboard 16
The Control Section + Display 17
The Balance Dial 17
Strings Section 18
Solo Section 20
The Vocoder Section 22
The Effects Section 23
Sound Modulation 24
System Settings 27
Appendix **29**
How a Vocoder works 29
Using the STVC Vocoder 29
Technical Data 31
Glossary 32
Product Support 37

Foreword

Thank you for purchasing the Waldorf STVC or just for reading this manual out of curiosity!

STVC is a string synthesizer in combination with a vocoder. String synthesizers came up in the 1970s, they aimed to recreate real string ensemble sounds using tricky electronic circuitry. They failed, at least according to todays standards, but the wonderful sound they produced has a lovely character that has been used in many popular recordings of that era. The STVC is Waldorf's 2nd strike (remember the famous Waldorf Streichfett?) to bring back this previously extinct species of string synthesizers.

The vocoder, short for voice coder, has originally been developed for transmission of voice signals for telecommunication. It allows speech transmission with very low bandwidth and results in a somewhat distorted, but intelligible speech. If applied to musical signals, the resulting signal sounds more or less like robotic speech or singing, and it is easy to extend it to polyphony. This is what the vocoder in STVC is for.

And now have fun with your STVC!

Your Waldorf Team

What to read?

The biggest problem with any manual is to find a way to address the needs of absolute beginners and experts alike. Some people read a manual cover to cover while others don't even touch it. Opting for the latter is a poor choice, especially when the manual describes a Waldorf instrument!

Notice

Waldorf Music is not liable for any erroneous information contained in this manual. The contents of this manual may be updated at any time without prior notice and firmware updates may add, remove or change features. We made every effort to ensure the information herein is accurate and that the manual contains no contradictory information. Waldorf Music extends no liabilities regarding this manual other than those required by local law.

This manual or any portion of it may not be reproduced in any form without the manufacturer's written consent.

Waldorf Music GmbH, Lilienthalstraße 7, D-53424 Remagen, Germany.

STVC Development Team

Software:	Stefan Stenzel
Hardware/Housing:	Frank Schneider
Design:	Axel Hartmann, Stefan Stenzel
Manual:	Stefan Stenzel, Holger Steinbrink
Sound Design:	Christian Gritzner, Lukas Schütte, Stefan Stenzel
Beta Testing:	Dr. Georg Müller, Lukas Schütte
Revision:	1.0, August 2019

We would like to thank

Thomas Brenner, Karsten Dubsch, Willie Eckl, Joachim Flor, Roger Keller, Jonathan Miller, Pierre Nozet, Miroslav Pindus, Oliver Rockstedt, Vladimir Salnikov, Winfried Schuld, Michael von Garnier, Kurt 'Lu' Wangard, Rolf Wöhrmann, Haibin Wu and anyone we have forgotten.

Control Features & Connections

Front Panel



1) Wheel Section
2) Master Volume
3) Control Section + Display
4) Solo Section
5) Strings Section
6) Vocoder Section with Microphone Input
7) Effects Section
8) Keyboard

Rear Panel Connections



1) Audio Outputs
2) Headphones Output
3) Pedal/Line Inputs
4) USB 2.0 Port for power supply and MIDI connection to computer
5) MIDI In / MIDI Out
6) Power Switch

Introduction

About this Manual

This manual was written to help you to become familiar with the Waldorf STVC synthesizer. It will also help experienced users discover exciting new features.

To avoid confusion, the terminology in this manual is based on the STVC parameter names. You will find a glossary at the end of this manual; it explains the various terms used.

We also use a uniform set of symbols to show you topics of particular interest or significance. Important terms are highlighted in bold letters.

Symbols

⚠ **Caution** – The information that follows this symbol will help you avoid errors, data loss or malfunctions.

ⓘ **Info –** Additional Information on a given topic.

Highlighted Control Features and Parameters

All of the STVC's buttons, controls and parameters are highlighted in **bold** letters throughout the manual.

Examples:

- Press the **Tweak** button.
- Turn the **Tone** control.

General Safety Guidelines

⚠ Please read the following safety tips carefully! They include several precautions you should always observe when dealing with electronic equipment. Read all of the instructions before operating your device.

Suitable Operating Conditions

- Use the device in enclosed rooms only.
- Never use the device in damp conditions such as bathrooms, washrooms, or around indoor swimming pools.
- Do not use the device in extremely dusty or dirty environments.
- Make sure that adequate ventilation is available on all sides of the device.
- Do not place the device near heat sources such as radiators.
- Do not expose the device to direct sunlight.
- Do not expose the device to extreme vibrations.

Power Supply

- Unplug the device when you are not using it for longer periods.
- Never touch the plug with wet hands.
- Always pull the plug when unplugging the device - never the cable.

Operation

- Never place objects containing liquids on or near the device.
- Place the device on a stable base only. Use a suitable platform.
- Make sure no foreign objects find their way into the chassis. If for some reason this occurs, switch the power off, unplug the device, and consult a qualified repair center.
- This device can generate volume levels that may do irreparable damage to your hearing when used on its own or with amplifiers, speakers, or headphones. For this reason you should keep the volume at tolerable levels.

Maintenance

- Do not open the device or remove the cover. Refer all service and repair tasks to qualified personnel. The interior of the chassis contains no components that require user maintenance.
- Use only a dry, soft cloth or brush to clean the device. Never use alcohol, cleaning solutions or similar chemicals. They will damage the surface of the chassis.

⚠ **Warning!** This device can cause sleep deprivation and sudden levitation.

Proper Use

This device is designed exclusively to produce low-frequency audio signals for the purpose of generating sound. Any other use is prohibited and voids the warranty extended by Waldorf Music. Waldorf Music is not liable for damages due to incorrect use.

⚠ This device, used with amplifiers, speakers or headphones, can generate volume levels that may result in irreparable damage to human hearing. For this reason, volume should be kept at moderate levels at all times.

⚠ Do not place your STVC anywhere near children, mothers-in-law or pets. This could lead to critical interactions.

Setup and Connections

The Waldorf STVC comes complete with:

- the Waldorf STVC Synthesizer itself
- an external USB power supply (DC 5V / 1A)
- a gooseneck microphone
- a printed Quick Start manual

Please ensure all the above items were included. If something is missing, contact your local dealer.

We recommend that you save the original packing material for future transport.

Setup

Place the STVC on a clean, even surface.

Connections

In order to get started with your STVC you will need an AC power outlet or a suited computer with USB port, a mixing console, an amp, and/or an audio monitor such as a speaker cabinet or a headphone.

You can also use a computer or sequencer to make use of STVC's MIDI features.

To connect the devices:

1. Turn all units off.
2. Connect the STVC's **Audio Out** to your mixing console or your computer audio interface. Optionally connect the stereo **Headphones** outputs to a headphone.
3. Connect the USB power supply that came with the STVC to a suitable AC power outlet.
4. If you want to use a computer, connect the STVC's **USB** port with a USB cable to your computer (Windows or macOS). Thereafter, the STVC becomes automatically available as a MIDI device. In this case, the computer delivers the power.
5. Optionally you can connect the STVC's MIDI ports to a MIDI interface or other MIDI devices.
6. Connect the included gooseneck microphone to the **Microphone XLR Input** jack on the front panel of STVC. This is necessary for working with the vocoder.
7. Press the power switch on the rear panel.

8. Then switch on your computer (if connected), the mixing console and finally the amplifier or active monitor speakers.

The overall volume of the STVC can be controlled with the **Master Volume** dial. This also affects the **Headphones** output.

If you do not choose to connect a mixing console, you can patch the STVC's output signals directly to an amplifier or an audio interface. Use an input usually called Line, Aux or Tape input.

The STVC's audio outputs deliver unbalanced line levels. When connecting to an amplifier, a mixing console or an audio interface with automatic balanced/unbalanced sensing inputs, please make sure to use TS mono jack cables and not TRS stereo jack cables.

Before connecting and disconnecting the STVC to a power supply source, turn your amp's volume control all the way down to avoid damage due to on/off switching noise. The STVC produces a high level output signal. Please take care that the connected playback device is suitable for the high level of an electronic instrument. Never use the microphone or phono input of the connected amp!

The Rear Panel Connections

The STVC provides an analog stereo audio output and a headphones output. Both outputs are affected by the setting of the Master Volume control.

Audio Output

Connect the left and right jack with 1/4-inch mono plugs for using STVC as stereo device. If you want to use it as mono device, only connect the **Right/Mono** jack of the output pair with a 1/4 inch mono plug and make sure not to connect any cable into the **Left/Stereo** jack.

Headphones Output

Here you can connect any headphone with a 1/4-inch stereo plug. The headphone output uses the same signal as the main output.

Pedal/Line Inputs

The **Line** input allows you to connect any suitable expression pedal or a mono jack to send a line audio signal into the STVC. Here, you can either use an expression pedal or the line input. Both at the same time is not possible.

The expression pedal won't have any effect unless it is assigned to a destination in the **Tweak** menu.

The **Line** input can be used as a line signal input for an external vocoder speech or carrier signal.

In the **System** settings, you can define if the **Line** input works as speech or carrier signal input. If set to *Off*, it works as Expression pedal input. Read more in the chapter "The Vocoder Section".

A sustain pedal switch connected to the **Sustain** input enables you to hold played notes as long as you press the pedal.

The USB Connection

The USB connection of the STVC allows:

- Power supply via USB when connected to a suitable computer
- Power supply via the USB power supply
- Transmitting and receiving MIDI data
- Dumping of firmware updates to the STVC

Make sure that you use a USB 2 port on your computer and a USB 2 compatible cable to avoid problems with data transmission.

The **USB** port connects the STVC to your computer with the following system requirements:

- Windows PC: Windows 7 or newer, a USB 2 port
- Apple: Intel Mac with macOS 10.9 or newer, a USB 2 port

MIDI In/Out Jacks

Although we can hardly believe it, the STVC might not be enough for some people, so we added an elegant way to control external sound modules with the STVC keyboard: just connect the DIN MIDI out to your external gear and play. For use with a computer we recommend the **USB** port.

Basic Controls

Switching On / Off

Switch the STVC on:

- Press the Power switch on the back of the STVC. After this, the display shows the software version and the STVC is ready to play.

Switch the STVC off:

- Press the Power switch again to switch off the STVC.

Master Volume

Use the **Master Volume** to control the STVC's overall volume. The volume setting is global and affects the level of the audio outputs including the headphones output.



Playing and Selecting Sounds

Move the **Rotary** dial right of the display or press the **Plus/Minus** buttons and the buttons **A/B/C** of to navigate through sounds and banks. When leaving the factory, bank **A** and **B** contain the factory presets. Bank **C** is unused so you can save your own sounds there. If you select any preset, where the **Vocoder** button is lit, you might not hear anything unless you speak into the microphone and press at least one of the keys.



Editing Sounds

The front panel offers easy access to the most important aspects of the sound. Turning a dial clockwise increases the corresponding value; turning it counterclockwise decreases it. Just as easy to operate the switches. Move a switch to its desired position. Keep in mind that most of the switches offer more than two states.



More specific control is offered by the **Tweak** functionality, which is explained on page 24.

Saving Sounds

Press and hold any of the Bank buttons **A/B/C** until the display offers to store the sound and **Plus/Minus** buttons are flashing. You can select a new destination with the **Rotary** dial. Press **Yes** to store to the selected destination, or **No** if you have made up your mind and decided not to store this sound.

There is an easy way to name a sound during the storing procedure:

- Use the **Keyboard Transpose** switch to move the cursor to the right or to the left position.
- Press a key on the keyboard to select a desired letter or number. The lowest key sets a space.

The Control Panel

The Wheel Section

Use the Pitch bend wheel to alter the pitch of the played notes. It will jump to the center position when you release it.



The Modulation wheel sets the vibrato level and speed of Strings and Solo sections. The state of the Modulation wheel is stored with the sound program. When you recall a sound program, the vibrato settings are also restored. As soon as you move the Modulation wheel, this replaces the stored setting.

If you select the Pluto tone in the **Solo** section, which contains an additional vibrato, this is synchronized to the vibrato of the Modulation wheel.

The Keyboard

You might have used a similar one before, but as it is rarely described elsewhere, this is how you use it: Hit any black or white key to hear a sound. Also the pitch of the sounds are usually higher the more you play on the right side and lower on the left side. The white keys consist of notes from the C major scale, if you use another scale you will very likely have to use some of the black keys as well.

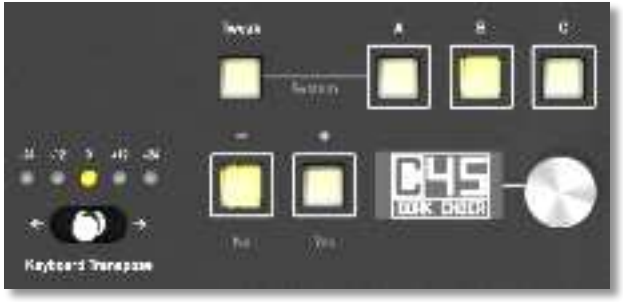
Keep in mind to play at least one key on the keyboard to hear an effect when using the vocoder.



The Control Section + Display

Here you can select factory or user sounds, save edited sounds and make basic settings for the STVC.

ⓘ Sound selection and storing sounds is described in the "Basic Controls" chapter.



Keyboard Transpose Switch

Although the MIDI standard requires 128 keys, STVC offers only 49 of those. To compensate this limitation, we added this switch to enable you to reach more keys that physically accessible. Switch to the left to go one or two octaves lower, switch to the right to go one or two octaves higher.

The Tweak Button

This button offers the following functions:

- It is used for setting up modulations. Please read more on page 24.
- Pressing **Tweak** and **A** opens the System settings mode. Please read more on page 27.
- Hold **Tweak** and press the **NO** button to send an All Notes Off message. This ends all sounding voices.

The +/- Buttons

With these buttons you can confirm different actions or select parameters. The use of these buttons is explained in the corresponding manual chapters.

The Balance Dial



The sound engine consists of two parts: Strings and Solo, clearly labeled on the panel. **Balance** controls the mix of these two. The leftmost position selects the **Solo** section only, while on the far right only the **Strings** section is audible. In the middle position, both Strings and Solo are mixed with full scale.

Strings Section



The Strings section mimics string and other sounds, similar to how string machines of the 1970 did this. Don't expect realistic string sounds here - expect realistic string machine sounds.

Registration

This is the oscillator bank, equalizer and formants setting for the sound of the Strings section. For string sounds, this fades smoothly through Violin, Viola, Cello, Brass, Organ, Choir as well as combinations of the registrations. If the vocoder is active (the **Vocoder** button lits), the registrations are as follows:

- **F-** Formants lowered, resulting in a more male or monster like voice
- **N** – Neutral setting, creates a clean vocoder sounds
- Squarish carrier signal
- **J** – Jitter applied to carrier, resulting speech sounds hoarse or noisy
- **F+** Formant frequencies increased, resulting in a more female or childish voice

Octaves Selector

Three octave positions are available here:

- **Base**: Normal octave setting
- **Both**: Normal and 8va octave mixed
- ***8va***: One octave higher than base octave

Crescendo

The attack rate for the strings envelope. We called it crescendo to honour a well-known instrument.

Release

This is the release rate for the strings envelope. Sustain is always at 100%, so there is no need for a decay setting.

Ensemble Button

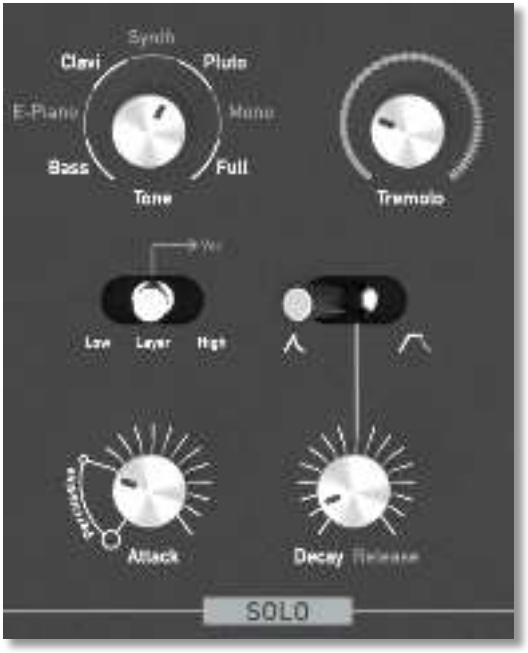
This button controls the Ensemble effect, an advanced chorus with multiple delay lines and modulation LFOs. It is an essential part of the typical string sound.

String/Chorus Switch

Three modes for the ensemble effect can be selected here:

- **String** (left position): The classic ensemble effect for string machines with LFOs at two different frequencies.
- **String + Chorus** (middle position): Combination of string and chorus for maximum depth and width of the sound.
- **Chorus** (right position): Normal chorus effect with only one LFO.

Solo Section



The Solo Section is a 16-voice synthesizer that complements the strings.

Split/Layer Selector

Sets the keyboard range for the solo section:

- **Low** (left position) played on keys lower than the split key. Holding down a key while selecting "Low" sets the split key to highest note for the solo layer.
- **Layer** (middle position) plays on all keys. If the vocoder is active, solo is mixed to the vocoder carrier and the inherent filter is bypassed.
- **High** (right position) played on keys higher or same as the split key. Hold down a note while switching to set the split key.

Tone

This is the sound setting for the Solo section. Moving this knob blends smoothly through sounds named Bass, E-Piano, Clavi, Synth, Pluto, Mono and Full. Note that sounds only have a faint resemblance to their names, which is common for the genre of String synthesizers. Bass plays an octave lower, Mono and Full are monophonic sounds.

Tremolo

Rate and depth of the stereo tremolo effect. If the Solo section is played through the vocoder, tremolo reverts to mono.

Attack

In addition to setting the attack rate of the envelope, the first quarter controls how much of a percussive click sound is added on the start of a note.

Decay/Release

The release or decay rate of the envelope, depending on the selected **Envelope Mode**.

Envelope Mode Selector

This switch controls the envelope operation:

- In the left position, the envelope has no sustain and decays immediately after the initial attack. This is perfect for clavinet or bass sounds.
- In the right position, notes are held at full sustain level until keys are released.

The Vocoder Section

ⓘ Want to know how a Vocoder works? Please refer to the corresponding chapter in the Appendix of this manual.



Vocoder Button

Press this button to activate/deactivate the vocoder. When active, this button lights up.

ⓘ To hear the Vocoder in effect you need to talk into a connected microphone and press at least one key on the keyboard simultaneously. Instead of the microphone input signal you can use a line signal coming through the pedal input or a recorded freeze loop (see below).

Microphone XLR connector

Here you can connect the inlcuded gooseneck microphone or any other suited microphone.

ⓘ Note that only 2.4 V phantom power is supplied, microphones requiring 48 V or 12 V are not supported.

Freeze Button

Press and hold the **Freeze** button to record the microphone singal. To specify this, only the filter coefficients, not the audio signal itself is recorded. The recorded signal is then played back in a loop. With the **Save** function you can save the audio loop, so that it remains after switching off. Otherwise everything is gone after switching off the STVC. Keep in mind that only one audio loop can be saved.

ⓘ The maximum recording capacity depends on the incoming audio signal and should be about 20 seconds.

ⓘ If you want to use a recorded Freeze signal again, press both the **Vocoder** and the **Freeze** button. Otherwise a new recording procedure starts and overwrites the internal memory.

The Effects Section



The effect section offers three effects, which can be used simultaneously.

Effect Selector

This switch selects which effect can be adjusted by the **Depth** and **Rate** dials. Note that all three effects can be combined simultaneously.

- **Animate:** A Low Frequency Oscillator (LFO) modulates the Strings registration. Depth and rate are controlled by the **Depth** and **Rate** potentiometers.
- **Phaser**: Classic phase shifter effect. Feedback and depth are adjustable with **Depth** according to the most pleasing settings we could find. Rate is controlled, as you can certainly understand it, by **Rate**.
- **Reverb**: Reverberation with adjustment of size and dampening of the ambient room according to useful settings by the **Rate/Size** knob, while **Rate/Mix** controls the wet/dry mix.

Rate/Size

Controls Rate for the **Animate** and **Phaser** effects and room size for **Reverb**.

Depth/Mix

Controls Depth for the **Animate** and **Phaser** effects and mix for **Reverb**.

Sound Modulation

The Tweak function allows adjustment or modulation for the sound. Press the **Tweak** button to edit or check tweaks. Use the **+/-** buttons to navigate through modulation slots and settings and the **Rotary** dial to change these.



Five tweak slots are available, each consisting of a source, an amount and a destination. Once the source is selected and not set to *off*, the second column shows a numeric amount constant from 0 to 127. Depending on the selected source, the destination is affected in different ways. The fifth tweak slot is special because the amount itself can be tweaked. Sources can be any of these:

Source	Description
OFF	Nothing, used to deactivate a tweak slot
SET	Override and set value
ADD	Add a constant
SUB	Subtract a constant
TOUCH+	Keyboard Aftertouch for modulation
TOUCH-	Negative Keyboard Aftertouch for modulation
MODW+	Modulation Wheel
MODW-	Modulation Wheel negative
BEND+	Pitch Bend
BEND-	Pitch Bend negative
EXPR+	Expression Pedal
EXPR-	Expression Pedal negative
VELC+	Velocity
VELC-	Velocity negative
CTRX+	Control X (see System settings on page 27)
CTRX-	Control X negative
LFO-V	Vibrato LFO
LFO-T	Tremolo LFO
LFO-C	Chorus LFO

LFO-S	String Ensemble low LFO
LFO-2	String Ensemble high LFO
LFO-A	Animate LFO
LFO-P	Phaser LFO
RAND1	Random
RAND2	Random on each new note

The next column after the source shows the numeric constant, and the last column shows the destination:

Destination	**Description**
VIBRATO	Vibrato depth, default set by Modulation Wheel and Aftertouch.
VIB.RATE	Vibrato rate
REGISTR.	Registration for strings and vocoder
REG.EQ	String EQ setting, usually tied to Registration
REG.SHAPE	String Osc shape, usually tied to Registration
CRESCENDO	Attack Rate of String envelope
RELEASE	Release Rate of String envelope
BALANCE	Balance of Solo and String section
VOLUME	Volume
PITCH	Pitch of Solo and String section
PT.STRING	Pitch of String section
PT.SOLO	Pitch of Solo section
TONE	Solo Tone
CUTOFF	Solo Filter Frequency
EMPHASIS	Solo Filter Resonance
ATTACK	Attack Rate of Solo envelope
DECAY/REL	Decay or Release Rate of Solo envelope
TREMOLO	Tremolo Rate and Depth
TRM.DEPTH	Tremolo Depth
TRM. RATE	Tremolo LFO Rate
MON.GLIDE R	Glide Rate for monophonic Solo
EV. SIZE	Reverb room size
REV. MIX	Reverb mix
PHS. RATE	Phaser LFO rate
PHS.DEPTH	Phaser depth
ANM. RATE	Animate LFO rate
ANM.DEPTH	Animate depth
CHR. RATE	Chorus LFO rate
CHR.DPETH	Chorus depth
STR. RATE	String Ensemble low LFO rate
STR.DEPTH	String Ensemble low mod depth
ST2. RATE	String Ensemble high LFO rate

ST2.DEPTH	String Ensemble high mod depth
V.FORMANT	Vocoder Formant shift
V. JITTER	Jitter of vocoder carrier, String section only
V. SPEED	Vocoder input adaption speed
V.IN LEAK	Amount of speech signal leaked into output
FRZ.SPEED	Freeze speed for frozen vocoder
FRZ. POS	Freeze position for frozen vocoder
TWEAK #5	Tweak slot #5 amount
BOTTOM	Adjust the low end

If a new modulation is set, the standard assignment will be overwritten. For example, if the Mod Wheel is used for controlling the Reverb mix, the former destination "LFO speed" will be replaced.

System Settings



To access the System settings, hold **Tweak** and press the **A** button. Select the item to be changed by the **Plus/Minus** buttons and change the setting using the **Rotary** dial. The following settings are available:

- **MIDI CHANNEL**: Sets the basic send and receive channel for the STVC. This setting is valid for all Sound programs. If *omni* is selected, the STVC sends on channel 1 and receives on all channels.
- **MASTER TUNING**: Controls the STVC's overall pitch in Hertz. The value specified here is the reference pitch for MIDI note A3. The default setting is 440Hz, which is commonly used by most instruments.
- **TRANSPOSE**: Allows a global pitch transposition for the tone generator in semitones.
- **PITCH BEND RANGE**: Determines the intensity of the pitchbend in semitones.
- **CONTROL X**: This parameters is used to define an arbitrary MIDI Continuous Controller as a modulation source.
- **TX EDITS**: If active, sound edits are transmitted as MIDI Controller messages.
- **TX PROGRAM CHANGE**: If active, a corresponding Program Change message is transmitted when a sound program is selected.
- **TX AFTERTOUCH**: If active, MIDI aftertouch messages are transmitted, when a key is hold and pressed.
- **TX KEYS/CONTROLS**: Determines, if notes, Pitchbend and Modulation Wheel messages are transmitted via USB MIDI and DIN MIDI.
- **LOCAL CONTROL**: Determines, if the keyboard, pitch bend and modulation wheel are coupled to the internal tone generation. When set to *ON*, the STVC sends all note information and controller data to the tone generation and eventually over MIDI. When set to *OFF* the STVC doesn't send any note information to its tone generation but works similar to a MIDI master keyboard. The *OFF* setting is only valid until the STVC is switched off. Hint: Hold **Tweak** and the **NO** button while switching on the STVC sets **LOCAL CONTROL** to *OFF*.

- **DEVICE ID**: Defines the device identification number for system exclusive data transmission. System Exclusive data contains no MIDI channel information so this ID is used to distinguish between several STVC units, if you have more than one STVC in your setup. Transmission will only be executed successfully if the sender and receiver are set to the same SysEx ID.
- **LINE IN**: Allows switching the Line input signal for the Vocoder as *Speech* or *Carrier*. If set to *Off*, the Line/Pedal Input can be used as an expression pedal input.
- **INPUT GAIN**: Sets the sensitivity of the Microphone and Line input in steps of 3 dB. The default setting is +18dB.
- **INPUT LOW-CUT**: Sets a low cut filter for the Mic/Line input which offers the following settings: Off, 10 Hz, 100 Hz or 200 Hz. This allows you to remove unwanted bass frequencies from the input signal.
- **MIC POWER**: Determines the supply voltage, required for the supplied gooseneck microphone. This setting should be disabled when using a dynamic microphone. Note that only 2.4 V is supplied, microphones that require 48 V or 12 V are not supported.

ⓘ Hold **Tweak** and press the **NO** button to send an *All Notes Off* message. This will end all sounding voices.

Appendix

How a Vocoder works

A Vocoder is a circuit to process the frequency content of one signal with the frequency content of another signal. This is done by splitting up the analysis signal (also known as Speech signal) with bandpass filters into several frequency bands. The volume of each frequency band is then evaluated with an envelope follower, and the resulting envelope is used to control the volume of a bandpass filter that processes the synthesis signal (also known as Carrier signal). The synthesis signal is therefore filtered by as many bandpass filters as the analysis signal, so that each analysis filter finds its synthesis filter counterpart.

This technique was developed as early as World War II, but the plan then was to use it to encrypt speech when transmitted by radio, rather than using it to create musically useful sounds. However, this shouldn't disturb you and you should feed a Vocoder with speech, drum loops or any other collection of external audio material you like. The results will always be complex and interesting, sometimes close to the original signal and sometimes much altered. Experiment and have fun!

For the Vocoder, you always need two signals, a signal that is analyzed (*Speech* signal) and another signal (*Carrier*) that is used for processing by the synthesis filters. The analyzed signal always comes from a different source, either a connected microphone or from the external input. The synthesis signal is mostly the current sound of the synth engine.

Using the STVC Vocoder

ⓘ Make sure that a suited microphone is connected to the STVC. It should be a dynamic type that doesn't need phantom power and devivers a sufficient level. Don't use any preamp between the micrtophone and the STVC.

- Activate the Vocoder by pressing the **Vocoder** button so that it lit.
- Talk into the microphone while playing on the keyboard. You need at least to press and hold one key.
- For a spoken or sung voice, you should take use of the different Vocoder **Registration** settings.
- If you want to control the **Registration** settings for the String section independently, set up a corresponding modulation (e.g. Modulation wheel controls REG.SHAPE).

- Press and hold the **Freeze** button to record a speech signal that can be used as analysis signal instead of the microphone signal. If **Freeze** is activated, the recorded audio signal is playback in a loop. Keep in mind to play at least one key on the keyboard to hear the vocoder effect.
- You can also use the Pedal/Line input to feed the vocoder with an external speech signal. In the **System** settings, set **LINE IN** to *Speech* and use any desired external audio signal. Keep in mind to play at least one key on the keyboard to hear the vocoder effect.
- You can also use an external audio signal as Carrier signal. In the **System** settings, set **LINE IN** to *Carrier* and feed any desired external audio signal into the Pedal line input. We recommend to use a sustained sound with harmonics. Keep in mind to talk into the microphone and play at least one key on the keyboard to hear the vocoder effect.

Technical Data

Power Supply

Maximum current consumption:	200 mA
Input Voltage:	5 V DC

Dimensions and Weight

Width:	740 mm
Depth:	280 mm
Height (including knobs):	100 mm
Total weight:	7,5 kg

Glossary

Aftertouch

The majority of contemporary keyboards are capable of generating aftertouch messages. On this type of keyboard, when you press harder on a key you are already holding down, a MIDI Aftertouch message is generated. This feature makes sounds even more expressive (e.g. through vibrato).

Amount

The extent to which modulation influences a given parameter.

Amplifier

An amplifier is a component that influences the volume level of a sound via a control signal. This control signal is often generated by an envelope or an LFO.

Attack

An envelope parameter. 'Attack' is a term that describes the ascent rate of an envelope from its starting point to the point where it reaches its highest value. The Attack phase is initiated immediately after a trigger signal is received – i.e. after you play a note on the keyboard.

Clipping

Clipping is a sort of distortion that occurs when a signal exceeds its maximum value. The curve of a clipped signal is dependent of the system where the clipping takes place. In the analog domain, clipping effectively limits the signal to its maximum level. In the digital domain clipping is similar to a numerical overflow and so the polarity of the signal's part above the maximum level is negated.

Control Change (Controllers)

MIDI messages enable you to manipulate the response of a sound generator to a significant degree.

This message essentially consists of two components:

• The Controller number, which defines the element to be influenced. It can be between 0 and 120.

• The Controller value, which determines the extent of the modification.

Controllers can be used for effects such as slowly swelling vibrato, changing the stereo panorama position and influencing filter frequency.

Decay

'Decay' describes the descent rate of an envelope once the Attack phase has reached its zenith and the envelope drops to the level defined for the Sustain value.

Envelope

An envelope is used to modulate a sound-shaping component within a given time frame so that the sound is changed in some manner. For instance, an envelope that modulates the cutoff frequency of a filter opens and closes this filter so that some of the signal's frequencies are filtered out. An envelope is started via a trigger – usually a fixed trigger. Normally the trigger is a MIDI Note. The classic envelope consists of four individually variable phases: Attack, Decay, Sustain, and Release. This sequence is called an ADSR envelope. Attack, Decay, and Release are time or slope values, and Sustain is a variable volume level. Once an incoming trigger is received, the envelope runs through the Attack and Decay phases until it reaches the programmed Sustain level. This level remains constant until the trigger is terminated. The envelope then initiates the Release phase until it reaches the minimum value.

Filter

A filter is a component that allows some of a signal's frequencies to pass through it and dampens other frequencies. The most important aspect of a filter is the filter cutoff frequency. The most common type is the lowpass filter. A lowpass filter dampens all frequencies above the cutoff frequency.

Filter Cutoff Frequency

The filter cutoff frequency is a significant factor for filters. A lowpass filter dampens the portion of the signal that lies above this frequency. Frequencies below this value are allowed to pass through without being processed.

LFO

LFO is an acronym for Low-Frequency Oscillator. The LFO generates a periodic oscillation at a low frequency and features variable waveshapes. Similar to an envelope, an LFO can be used to modulate a sound-shaping component.

Low Pass Filter

Synthesizers are often equipped with a lowpass filter. A lowpass filter dampens all frequencies above its cutoff

frequency. Frequencies below the cutoff point are not affected.

MIDI

The acronym MIDI stands for Musical Instrument Digital Interface. It was developed in the early ’80s so that diverse types of electronic musical instruments by different manufacturers could interact. At the time a communications standard for different devices did not exist, so MIDI was a significant advance. It made it possible to link any MIDI-equipped device with another through simple, uniform connections.

Essentially, this is how MIDI works: One sender is connected to one or several receivers. For instance, if you want to use a computer to play the STVC, then the computer is the sender and the STVC acts as the receiver. With a few exceptions, the majority of MIDI devices are equipped with two or three ports for this purpose: MIDI In, MIDI Out and in some cases, MIDI Thru. The sender transfers data to the receiver via the MIDI Out jack. Data is sent via a cable to the receiver's MIDI In jack.

MIDI Thru has a special function. It allows the sender to transmit to several receivers. It routes the incoming signal to the next device without modifying it. Another device is simply connected to this jack, thus creating a chain through which the sender can address a number of receivers. Of course it is desirable for the sender to be able to address each device individually. Consequently, there is a rule that is applied to ensure each device responds accordingly.

MIDI Channel

This is a very important element of most messages. A receiver can only respond to incoming messages if its receive channel is set to the same channel as the one the sender is using to transmit data. Consequently, the sender can address specific receivers individually. MIDI Channels 1 through 16 are available for this purpose.

Modulation

Modulation influences or changes a sound-shaping component via a modulation source. Modulation sources include envelopes, LFOs, or MIDI messages. The modulation destination is a sound-shaping component such as a filter or an amplifier.

Note On / Note Off

This is the most important MIDI message. It determines the pitch and velocity of every generated note. The time of arrival is simultaneously the start time of the note. Its

pitch is derived from the note number, which lies between 0 and 127. The velocity lies between 1 and 127. A value of 0 for velocity is similar to 'Note Off'.

Panning

The process of changing the signal's position within the stereo panorama.

Pitchbend

Pitchbend is a MIDI message. Although pitchbend messages are similar in function to control change messages, they are a distinct type of message. The reason for this distinction is that the resolution of a pitchbend message is substantially higher than that of a conventional Controller message. The human ear is exceptionally sensitive to deviations in pitch so the higher resolution is used because it relays pitchbend information more accurately.

Program Change

These are MIDI messages that switch sound programs. Program numbers 1 through 128 can be changed via program change messages.

Release

An envelope parameter. The term 'Release' describes the descent rate of an envelope to its minimum value after a trigger is terminated. The Release phase begins immediately after the trigger is terminated, regardless of the envelope's current status. For instance, the Release phase may be initiated during the Attack phase.

Resonance

Resonance is an important filter parameter. It emphasizes a narrow bandwidth around the filter cutoff frequency by amplifying these frequencies. This is one of the most popular methods of manipulating sounds. If you substantially increase the resonance, to a level where the filter begins self-oscillation then it will generate a relatively clean sine waveform.

Sustain

An envelope parameter. The term 'Sustain' describes the level of an envelope that remains constant after it has run through the Attack and Decay phases. Sustain lasts until the trigger is terminated.

System Exclusive Data

System exclusive data allow access to the heart of a MIDI device, enabling access to data and functions that no other MIDI messages are able to address. 'Exclusive' in this context means that this data pertains to only one device type or model. Every device has unique system exclusive data. The most common applications for SysEx data include transfer of entire memories and complete control of a device via a computer.

Trigger

A trigger is a signal that activates events. Trigger signals are very diverse. For instance, a MIDI note or an audio signal can be used as a trigger. The events a trigger can initiate are also very diverse. A common application for a trigger is use to start an envelope.

Volume

The term describes a sound's output level

USB

The Universal Serial Bus (USB) is a serial bus system to connect a computer with an external device. USB equipped devices can be plugged together while active. The recognition is made automatically.

Product Support

If you have any questions about your Waldorf product, feel free to contact us via one of the three options listed below:

① Use the support form at our website. This is the most efficient and fastest way to contact us. Your questions will be forwarded immediately to the resident expert and you will quickly receive an answer.

https://support.waldorfmusic.com

② Send us a letter. It will take a bit longer, but it is just as dependable as the support form.

Waldorf Music GmbH
Lilienthalstr. 7
53424 Remagen, Germany

③ Visit our support forum at www.waldorfmusic.com

Waldorf Music GmbH • Lilienthal Straße 7 • D-53424 Remagen
© 2019 Waldorf Music GmbH • All rights reserved
www.waldorfmusic.com