

DESCRIPTION
REAL COMPETENCE

SINE WARP 9

MIDI Analog Multimode Filter



TERRATEC PRODUCER/SINE WARP 9

English Manual

Version 1.0, last revised: November 2003

CE Declaration

We:

TerraTec Electronic GmbH, Herrenpfad 38, D-41334 Nettetal, Germany

hereby declare that the product:

TerraTec Producer SINE WARP 9,

to which this declaration refers is in compliance with the following standards or standardizing documents:

1. EN 55013

2. EN 55020

The following are the stipulated operating and environmental conditions for said compliance:

residential, business and commercial environments and small-company environments.

This declaration is based on:

Test report(s) of the EMC testing laboratory



The information in this document is subject to change without notice and shall not be deemed as a warranty by the seller. No warranties, express or implied, are made with regard to the quality, suitability or accuracy of this document. The manufacturer reserves the right to change the contents of this document and/or the associated products at any time without the provision of prior notice to specific persons or organizations. The manufacturer shall not be held liable for damages of any kind arising from the use, or the inability to use this product or its documentation, even if the possibility of such damage is known. The information in this document is subject to copyright. All rights are reserved. No part of this manual may be reproduced or transmitted in any form or for any purpose without the express written permission of the copyright holders. Product and brand names contained in this document are used for identification purposes only. All registered trademarks, product designations or brand names used in this document are the registered property of their respective owners.

©TerraTec® Electronic GmbH, 1994-2003. All rights reserved (12.11.03).

Contents

Important safety information	4
Welcome!	5
Scope of delivery	5
1 Introduction	6
1.1 Connectors and controls:	6
1.2 Properties	8
1.3 Concept	8
1.4 Getting started	9
2 Function	11
2.1 VCF Modulation	11
2.2 Envelope.....	12
2.3 Triggering the envelope (Trigger Source – ENV Mode)	13
2.3.1 Trigger Source	13
2.3.2 ENV TRIGGER MODE	14
2.4 VCA Modulation (VCA Mode).....	17
2.5 LFO (Low Frequency Oscillator)	18
2.5.1 LFO Wave.....	18
2.5.2 LFO Reset.....	21
2.6 Analog Trigger	24
2.7 Output.....	25
2.8 Program selection.....	25
2.8.1 Manual program selection	26
2.8.2 Program selection via MIDI	26
2.9 Copying and saving programs	27
2.10 MIDI send and receive channels	27
2.10.1 Setting the send and receive channel.....	28
2.10.2 Saving the send and receive channel	28
2.11 Filter mode.....	29
3 MIDI control	30
4 Modulation 1	31
5 Appendix	32
5.1 Select 1 potentiometer calibration.....	32
5.2 Initializing programs	33
Service at TerraTec Producer	34
Internet, Hotline	34

Important safety information

- Please read all instructions before using this device.
- Never use the device near water, i.e. next to a bathtub, sink, or drain, in a damp basement or near a swimming pool.
- Used in combination with an amplifier and headphones or speakers, this device can cause sound levels that may result in lasting hearing damage. Avoid long exposure to excessive or unpleasantly high volume levels. Consult an ear specialist immediately if you detect a loss of hearing or a ringing in your ears.
- Ensure adequate ventilation for the device when setting it up.
- Do not install it near sources of heat such as radiators, ovens or similar devices.
- Ensure that the device is connected only to a standard AC outlet.
- Position it in such a manner that no dust, liquids or foreign objects can enter the housing.
- Unplug the external power supply from the AC outlet if you do not intend to use the device for an extended period.
- The device must be serviced by trained personnel if:
 - the external power supply is damaged,
 - objects or liquids have entered the device,
 - the device was left in the rain,
 - the device was damaged by dropping,
 - the device is malfunctioning.
- Do not attempt to repair the device yourself. Please consult a trained technician.
- Please ensure that all analog devices are turned off before plugging them in. This will protect you from any possible—albeit weak—electrical shocks, as well as protecting your speakers and your hearing from sudden peaks. For digital devices, be sure to at least lower the volume on your playback equipment.

Welcome!

We are pleased that you have chosen a TerraTec Producer rack system and would like to congratulate you on your decision. You've purchased a sophisticated product representing the state of the art of studio technology, and we're convinced that our product will prove extremely useful to you in the coming years and provide you with a great deal of entertainment.

This manual describes the SINE WARP 9 MIDI analog filter. It contains everything you need to know about the correct use of the systems, as well as a number of practical tips that will get you started right away.

We hope you enjoy your filter and would like to suggest that you browse this hopefully entertaining manual when you get the chance. In addition to the important information about its technology, we have outlined a number of typical applications as well as tips and tricks wherever appropriate. We're convinced that even experienced users will profit from this guide.

Thanks for your attention - and here's to your creativity.

Sincerely, Your TerraTec Producer Team

Scope of delivery

Start by making sure that the contents of the package are complete.

The **SINE WARP 9** MIDI analog filter must include at least:

- 19" rack filter SINE WARP 9
- 12V AC power adapter
- Customer service card
- Registration card with the serial number
- BeSonic Premium Account registration card
- This manual

Please return the enclosed registration card to us at the earliest possible opportunity or register online at <http://www.terratec.com/register.htm>. This is important for support and hotline services.

1 Introduction

1.1 Connectors and controls:

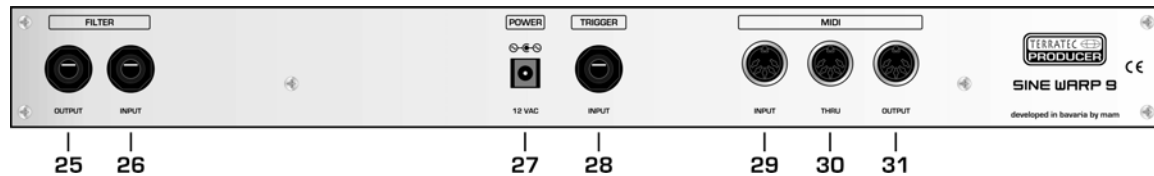
The front panel:



1. POWER: Power switch
2. Program: Program selection within the program group
3. Write: Save/copy program
4. Channel: Global MIDI send and receive channel
5. Mode: Filter type selection (monitor LED: LP/HP/BP/N)
6. Select: Selection of the active Modulation 1 parameter
7. A/B: Selection of the program group 1-16/17-32
8. LP: Low-pass filter LED
9. HP: High-pass filter LED
10. BP: Band-pass filter LED
11. N: Notch filter LED
12. TRIGGER: Monitor LED for a trigger signal
13. - 1 TRIGGER SOURCE: Selection of source (MIDI/analog) for ENV and VCA triggers
- 2 ATTACK: Envelope attack time
- 3 LFO RATE: LFO speed
14. - 1 VCA MODE: Selection of VCA modulation
- 2 DECAY: Envelope decay time
- 3 LFO DEPTH: Intensity of the filter modulation (cutoff) by the LFO
15. - 1 ENV TRIGGER: Envelope trigger mode
- 2 SUSTAIN: Sustain level of envelope
- 3 KEY FOLLOW: Intensity of the filter modulation (cutoff) by MIDI notes
16. - 1 LFO WAVE: Selection of the LFO waveform
- 2 RELEASE: Release time of the envelope
- 3 VELOCITY: Intensity of the filter modulation (cutoff) by MIDI velocity

- 17. - 1 LFO RESET: Selection of the LFO reset mode
- 2 DELAY: Envelope triggering delay time
- 3 MODULATION: Intensity of the filter modulation (cutoff) by the modulation wheel
- 18. TRIGGER LEVEL: Trigger threshold for analog triggering
- 19. ENV MOD: Intensity of the filter modulation (cutoff) by the envelope
- 20. CUTOFF: Manual adjustment of the cutoff frequency
- 21. RESONANCE: Manual adjustment of the filter resonance
- 22. VOLUME: Output volume
- 23. DISTORTION: Distortion effect on/off switch
- 24. BYPASS: Selector for original/filtered signal at output

The rear panel:

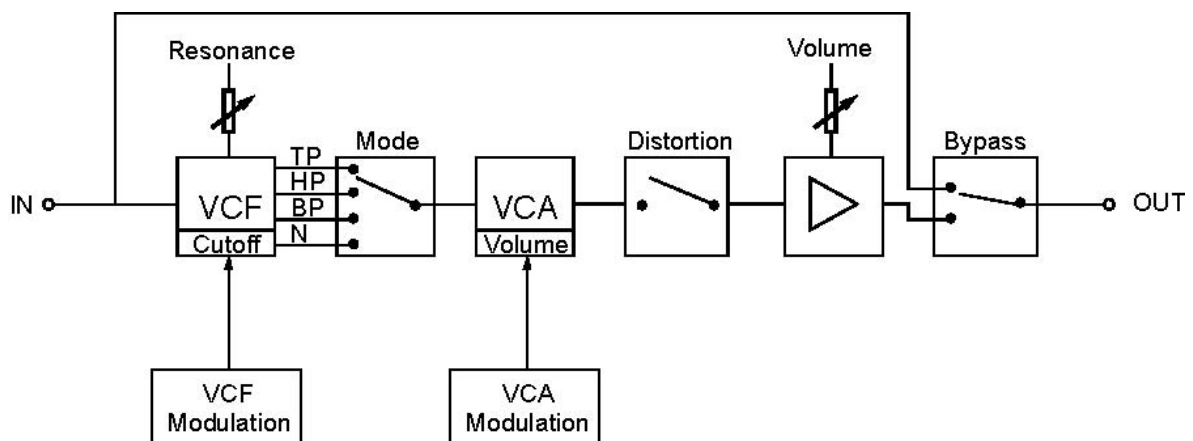


- 25. FILTER OUTPUT: Output socket (1/4" mono jack)
- 26. FILTER INPUT: Input socket (1/4" mono jack)
- 27. POWER 12 VAC: AC power
- 28. TRIGGER INPUT: Input for analog triggering. If this socket is not used, the FILTER INPUT signal will serve as the analog trigger signal.
- 29. MIDI INPUT: The data received here is used to switch programs, trigger the envelope and VCA and control the filter parameters.
- 30. MIDI THRU: MIDI feed-through socket
- 31. MIDI OUTPUT: Controller data output of the edited parameters

1.2 Properties

- MIDI-controllable 12 dB filter with resonance
- Filter types: Choice of low-pass, high-pass, bandpass and notch filter
- Volume modulation through VCA
- Filter modulations: LFO, envelope and MIDI combinable
- Control positions sent and received via MIDI
- 32 program memory slots
- Analog trigger input
- Switchable distortion effect
- Connections: Filter In/Out, Trigger In, MIDI In/Out/Thru,
- external power supply
- 1 HE, 19 inches

1.3 Concept



The input signal initially passes through an analog, voltage-controlled 12 dB filter with a variable resonance and cutoff frequency. The Function mode is used to select the VCF filter characteristic (low-pass, bandpass or notch). The dynamics of the filtered signal are then influenced by a voltage-controlled amplifier (VCA). The output features a volume control, a switchable distortion effect and a bypass switch. The modulation of the VCF is described in 2.1 and the VCA in 2.4.

1.4 Getting started

- Connect the included power adapter to the 12V AC socket on the rear panel of the SINE WARP 9. Switch the device on. The programs have been preconfigured with the following values:
 - MIDI channel: 1
 - Filter Mode: Low-pass
 - Trigger Source: AT (analog trigger)
 - ENV Trigger Mode: N1 (trigger envelope at beginning of trigger)
 - VCA Mode: On (VCA permanently on)
 - LFO Wave: Triangle
 - LFO Reset: Norm (no reset)
 - LFO Depth: 0
 - MIDI Modulation: Velocity, key follow, modulation wheel: OFF
- Connect an audio signal source to the FILTER INPUT socket and connect the output of the SINE WARP 9 (FILTER OUTPUT socket) to an amplifier or mixer.
- **Operation without MIDI:**

Set the resonance and cutoff filter parameters and the filter modes (select with the mode button) according to your wishes. By default the envelope is triggered by the filter input signal. Set the trigger level to ensure that triggering occurs (the Trigger LED lights up).

The cutoff frequency is modulated by the envelope. Set the intensity of this modulation with the ENV MOD control. The envelope characteristic can be set using the envelope parameters Attack, Decay, Sustain, Release and Delay (Select on 2). In addition, the cutoff frequency can be modulated using the LFO. Change the LFO Rate and LFO Depth parameters (Select on 3) for this purpose and select the waveforms using the LFO Wave control (Select on 1).

Set the VCA mode (Select on 1). In the Gate position, the VCA is active at constant volume when the trigger is active, in the ENV position the VCA is modulated by the envelope.

- **Operation with MIDI:**

Select Single mode as the trigger source (Select on 1). Next, trigger the envelope by sending Note On/Off messages to MIDI In (channel 1). The Trigger LED must flash on the Note On message.

The cutoff frequency can be modulated additionally with Velocity, Key Follow or the modulation wheel (Channel 1, Select on 3). Modulation is disabled in the middle position (when the Select LED flashes).

- **Controlling filters via MIDI:**

Connect a sequencer to the MIDI OUTPUT, start the sequencer in recording mode and adjust the Cutoff control, for example. The SINE WARP 9 will send controller data (channel 1) that will be recorded by the sequencer. When the sequencer sends the recorded controller data back to the WARP 9, the cutoff frequency will change to match the controller adjustment during recording.

- **Saving:**

To save the current settings, press the Write button. Press the Program button to select the program number under which you would like to save the settings. Each program number is indicated by a different state of the LP, HP, BP and N LEDs. Press the write button again to save the program. To cancel: press the Channel button, for example.

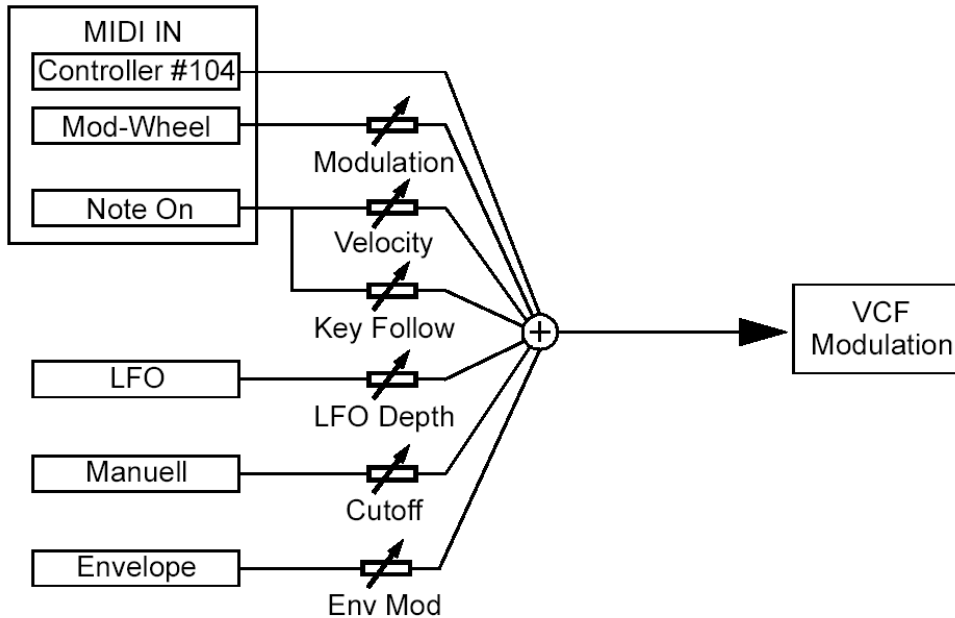
- **Other functions:**

In principle, you are now acquainted with the essential functions of the SINE WARP 9. Unusual modulations can be achieved with a variety of envelope mode settings (ENV Mode control), LFO waveforms (LFO Wave control, Select on 1) and LFO resets (LFO Reset control, Select on 1).

- For more information, read the manual thoroughly.

2 Function

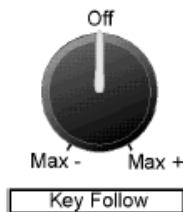
2.1 VCF Modulation



A variety of modulation sources that can be combined as needed are available for the modulation of the cutoff frequency.

■ MIDI

Controller (#104), modulation wheel, velocity and note data of the received Note On messages are processed. The intensity with which this data affects the cutoff frequency can be adjusted with the Velocity, Key Follow and Modulation controls:



Off: Note data is not processed
 Off...Max+: Notes higher than C3 increase, notes lower than C3 decrease the cutoff frequency
 Max-...Off: Notes lower than C3 increase, notes higher than C3 decrease the cutoff frequency



Off: Velocity data is not processed
 Off...Max+ Increasing velocity values raise the cutoff frequency
 Max-...Off: Increasing velocity values lower the cutoff frequency



Off: Modulation wheel data is not processed
 Off...Max+: Increasing modulation wheel values raise the cutoff frequency
 Max-...Off: Increasing modulation wheel values lower the cutoff frequency

- LFO

The LFO depth control adjusts the intensity of the LFO modulation.

- Manual

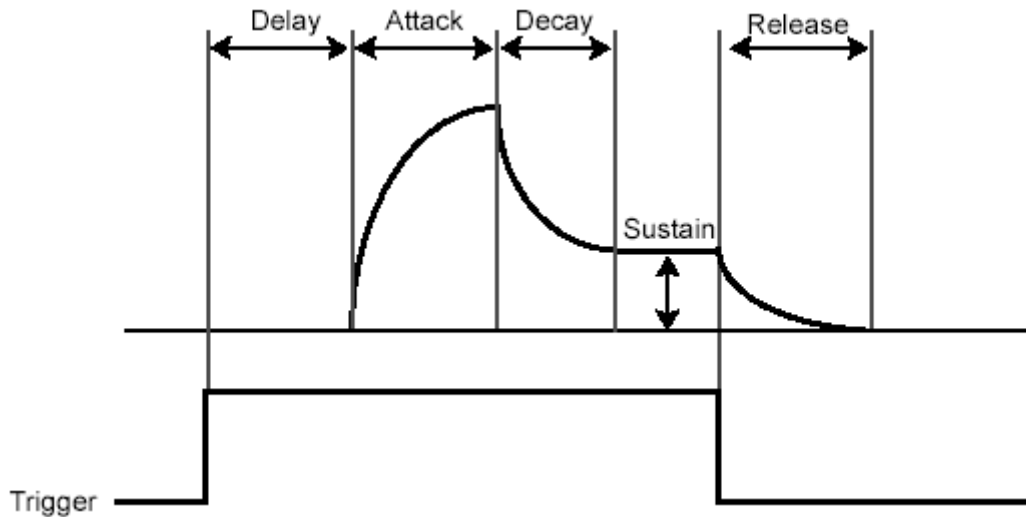
Manual adjustment of the cutoff frequency with the Cutoff control

- Envelope

Modulation of the cutoff frequency by the envelope of the SINE WARP 9. The ENV MOD control adjusts the modulation depth.

2.2 Envelope

The Warp 9 features an ADSR envelope with an adjustable delay. The following diagram shows the temporal progression of the envelope voltage when triggering the envelope.

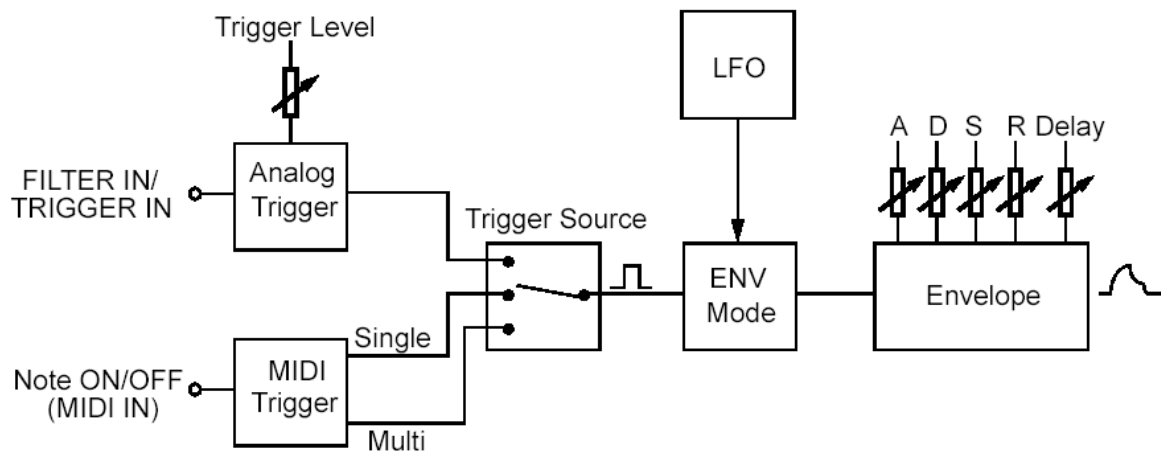


The envelope parameters can be set with the appropriate controls under MODULATION 1 (Select on 2):

- Delay: 0 - 1 second
- Attack: 1 millisecond - 10 seconds
- Decay: 1 millisecond - 10 seconds
- Sustain: 0 - 100%
- Release: 1 millisecond - 10 seconds

2.3 Triggering the envelope (Trigger Source – ENV Mode)

The following diagram illustrates the functional principle of the envelope circuit:



The envelope is triggered either by an analog signal applied to the FILTER INPUT or TRIGGER INPUT, or via MIDI using Note On/Off messages. Select one of the possible trigger types with Trigger Source. The original trigger signals (to Trigger Source) do not trigger the envelope directly, but are influenced by the ENV MODE parameter. For example, trigger signals are filtered out when the LFO drops below a specific value or only every second trigger signal is allowed to pass.

2.3.1 Trigger Source

■ Single

A trigger pulse is activated by each Note On message on the currently selected receive channel. The trigger pulse is ended by a Note Off message with the same note number (start of the release phase).

■ Multi

A trigger pulse is only activated by a Note On message if no other notes are active (all previously received notes were ended by specific Note Off messages or an All Note Off message). The triggering ends when all received notes (Note On messages) have been switched off (equivalent of an All Note Off message).

■ AT

Trigger signals are created by a connected audio signal.

2.3.2 ENV TRIGGER MODE

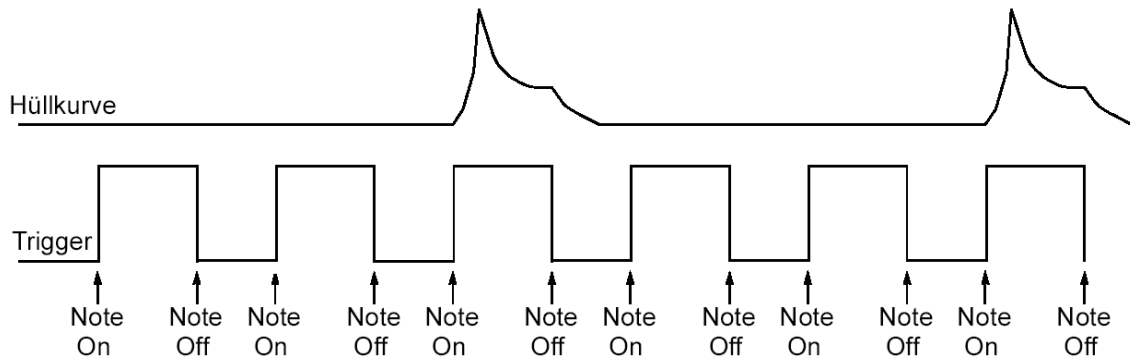
■ N1

Each trigger signal after the trigger source triggers the envelope.

■ N2,N3,N4,N5

The envelope is triggered only after every other (N2), every third (N3), every fourth (N4) or fifth (N5) trigger signal. All trigger signals in between are ignored.

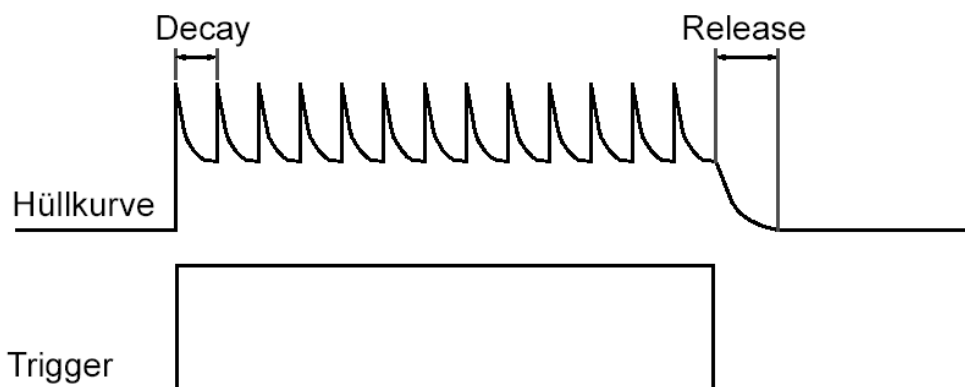
Example: Trigger Source: Single, ENV MODE: N3



■ RPT

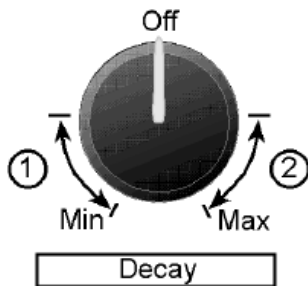
During an active trigger signal, the envelope will be triggered again every time the envelope voltage drops to the sustain level (end of the decay phase). This occurs with increasing frequency the lower the delay, attack and decay times are. The release phase does not begin until the end of the trigger. Very short delay, attack and decay times result in a very high repeat frequency, resulting in an effect similar to a ring modulator.

Example: Delay, Attack at minimum, Sustain 50%



■ **DLM (Delay-LFO Modulation)**

In this mode, each trigger signal after Trigg Source triggers the envelope, but the decay time changes depending on the current LFO value. The effect on the decay times depends on the position of the Decay control. Positions near the minimum and maximum values are especially effective.



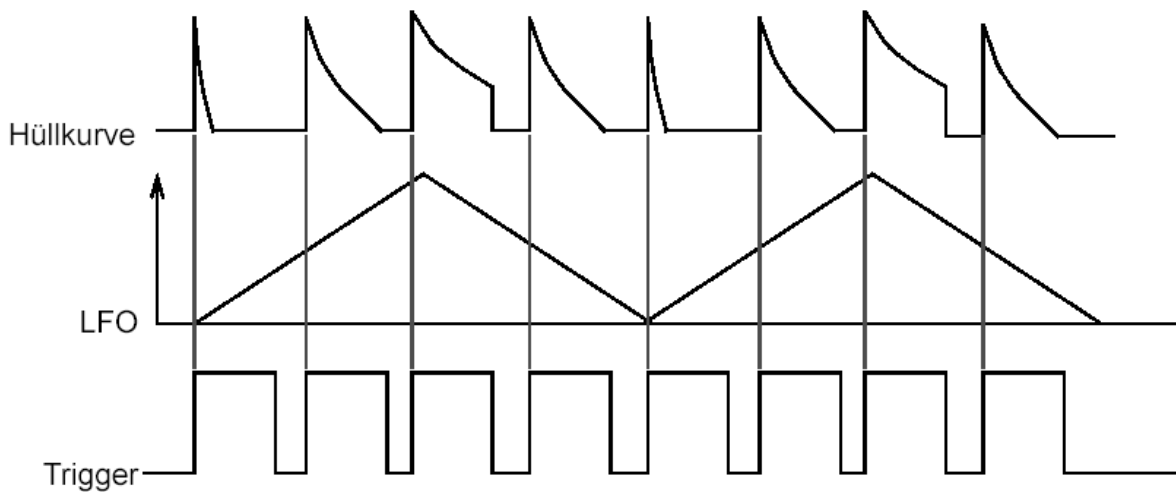
Range 1:

Increasing (decreasing) LFO values cause the decay to increase (decrease). The closer the control is to the MIN position, the shorter the overall decay time.

Range 2:

Depending on the current LFO value, the device switches between maximum (high LFO value) and minimum decay time (low LFO value). The closer the control is to the MAX position, the more prevalent minimal decay times will be.

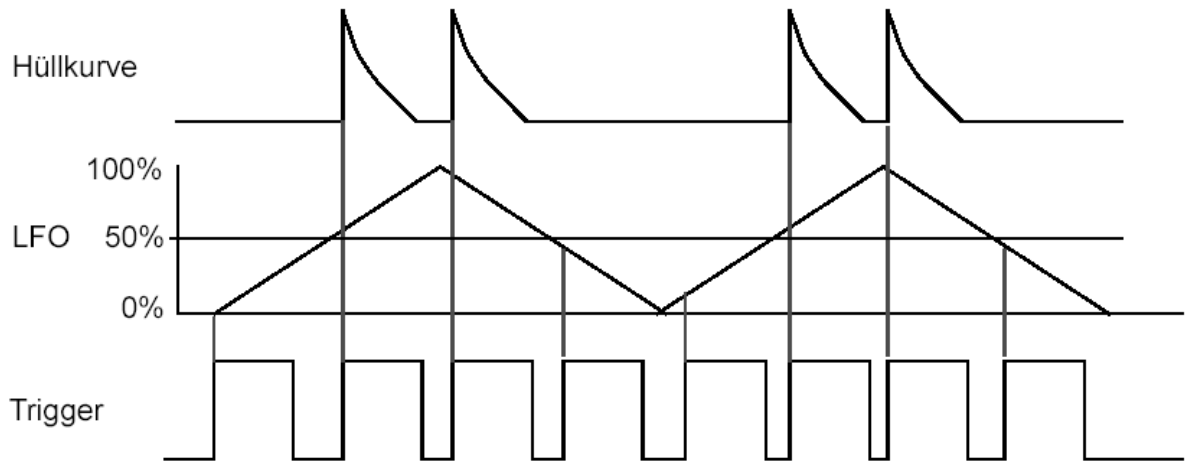
Example: Range 1, triangle LFO, Delay, Attack, Sustain and Release minimum



■ LT (LFO trigger)

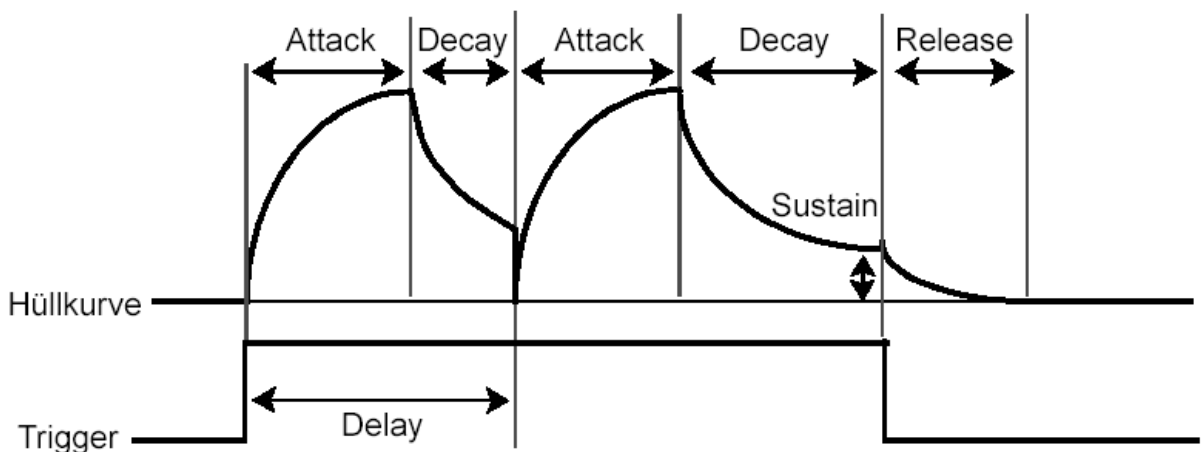
A trigger signal will only activate the envelope if the current LFO value is greater than 50%.

Example: triangle LFO, Delay, Attack, Sustain and Release minimum



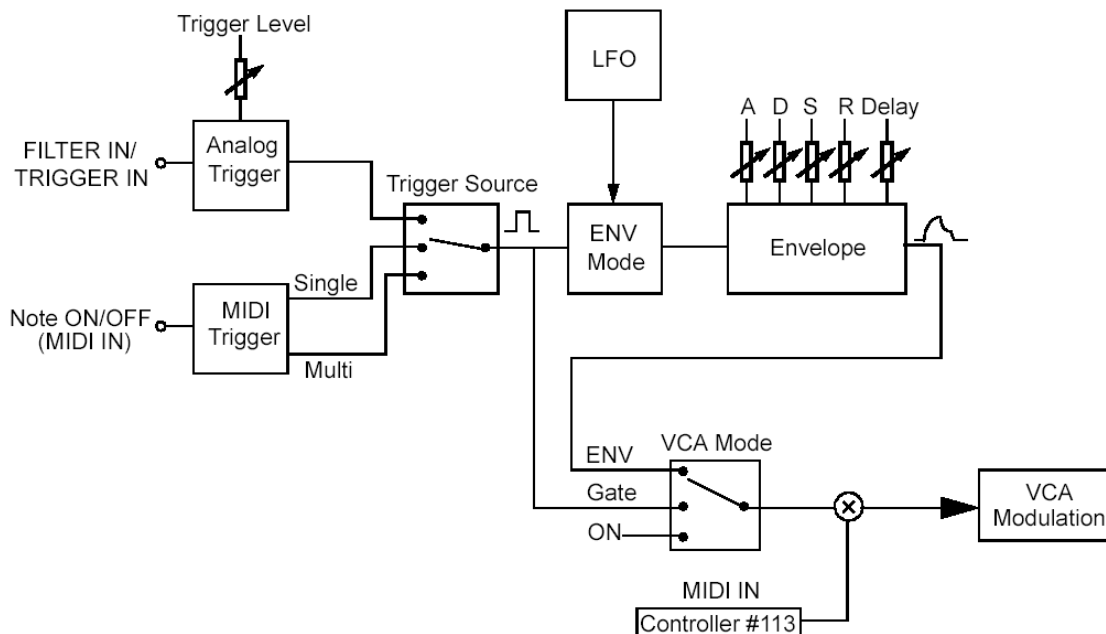
■ RD (Retrigger Delay)

At the beginning of the trigger activation, the envelope is initially triggered without delay (start of the attack phase). After the delay time from the start of the trigger has elapsed, the envelope is triggered again, provided the trigger is still active. Unlike RPT mode, the envelope will not be triggered further. The envelope will only be triggered once if the trigger pulse is shorter than the delay time.



2.4 VCA Modulation (VCA Mode)

The following diagram shows the various VCA modulation options:



■ ENV

The envelope voltage controls the volume of the VCA. The Trigger Source and ENV Mode parameters must also be taken into consideration here.

■ Gate

An active trigger signal after Trigger Source activates the VCA; if no trigger signal has been applied, the VCA is muted.

■ ON

This means that the VCA is permanently enabled.

The ENV/Gate/On VCA control signals can be influenced with controller 113 to increase or decrease the volume of the VCA. Valid controller values range from 0 (VCA mute) to 127 (maximum VCA volume). Please note that the VCA is always mute in Gate or ENV mode (if no trigger signal has been applied or the envelope has not been triggered). Only an active gate signal or a triggered envelope can be influenced by the controller.

2.5 LFO (Low Frequency Oscillator)

The LFO modulates the cutoff frequency. It has the parameters LFO Rate, LFO Depth, LFO Wave and LFO Reset which can be adjusted using the appropriate controls under Modulation 1.

■ LFO Rate

Speed of the LFO with an adjustable frequency from 0.01 Hz to 10 Hz

■ LFO Depth

Intensity with which the LFO modulates the cutoff frequency (0 to maximum)

■ LFO Wave

Selection of possible waveforms. In addition to "traditional" waveforms such as square wave, triangle, sawtooth, inverted sawtooth and random, waveforms are also available that can be manipulated by incoming trigger signals. These can be used to achieve rhythmic modulations.

■ LFO Reset

One strength of the LFO is its reset options. In this case this means restarting the LFO, starting at the lowest value. Resets can be triggered via the MIDI clock, Note On messages or Control Change messages.

The following is a detailed description of the LFO Wave and LFO Reset parameters.

2.5.1 LFO Wave

This section covers the various waveforms of the LFO. The following explanations apply in the event that the LFO is not reset (LFO Reset control in Norm position). The triggered waveforms process the trigger signals selected with Trigger Source.

- The waveforms correspond to the illustrations below. S/H is a waveform in which the LFO generates random values.

 Triangle

 Sawtooth

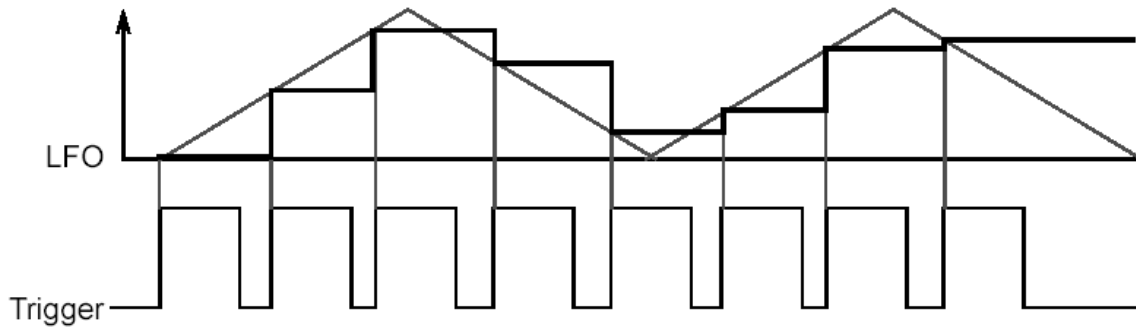
 Inverted sawtooth

 Square wave

S/H Random

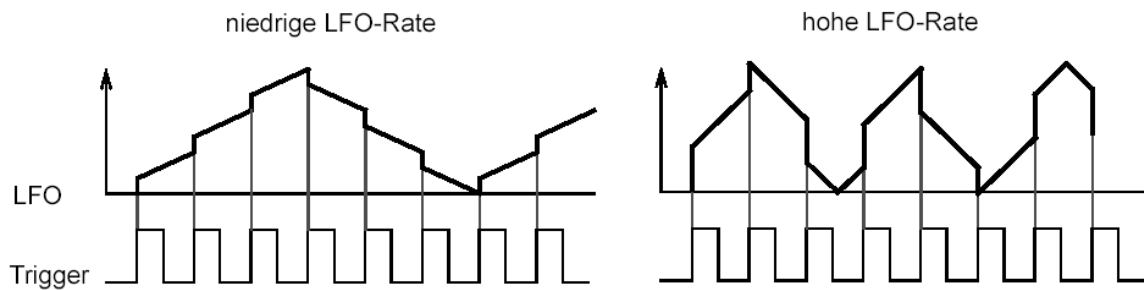
■ $\wedge T$

Generates a staircase voltage in which the triangle LFO is sampled by incoming trigger signals (Note ON or analog). With each trigger pulse, the LFO takes over the momentary triangle LFO value and holds it until the next trigger pulse is received. The random character of the staircase voltage increases as the trigger pulses become less regular and the LFO rate increases.



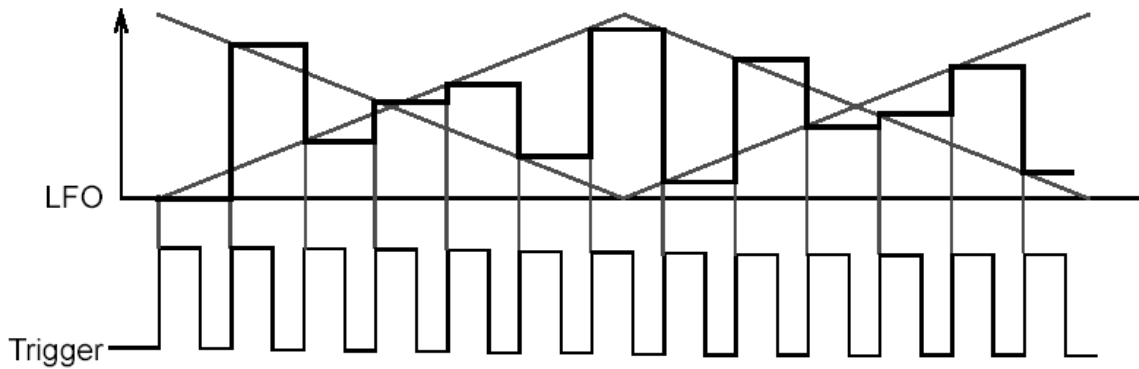
■ $\wedge C$

This waveform is a combination of triangle LFO and a staircase voltage. If no trigger pulse is received, the LFO generates a normal triangle signal. With each trigger pulse, the LFO value jumps upward (in the case of an ascending triangle flank) or downward (descending flank). The height of the jump increases with the LFO rate.



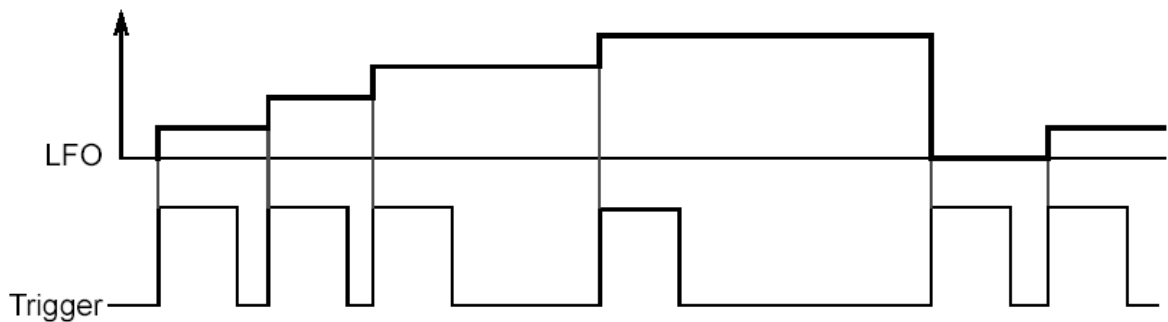
■ $\square T$

Corresponds to the $\wedge T$ waveform with the difference that the LFO value is alternately sampled from a normal triangle LFO and an inverted triangle LFO.



■ AT

The LFO generates a constant value that increases with each trigger pulse. This increase depends on the LFO rate, with a high LFO rate resulting in high jumps. The LFO once again starts at the minimum once a maximum value has been reached.



2.5.2 LFO Reset

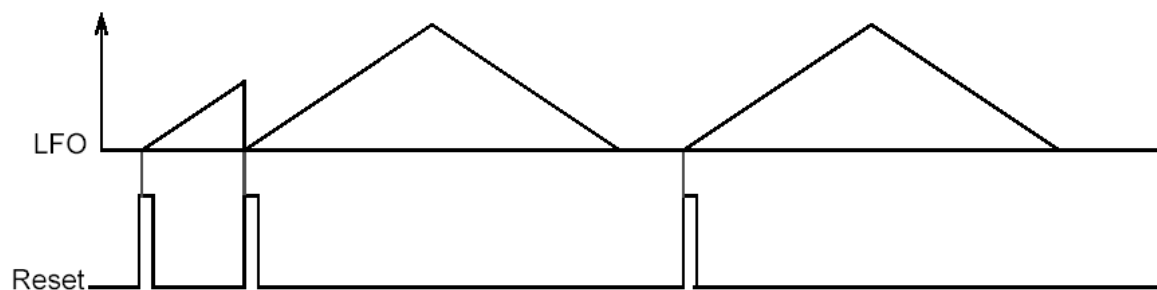
■ C2, C4, C8, C16, C32

The LFO Reset is triggered by the MIDI clock and after a specified number of quarter notes. Resets can be triggered after 2 (C2), 4 (C4), 8 (C8), 16 (C16) and 32 (C32) quarter notes. A reset affects the various waveforms differently:

- $\wedge \nearrow \searrow \square$

The LFO starts at the reset and stops after a period. If the period is not yet complete, the LFO will restart when reset. The duration of a period depends on the LFO rate. A suitable LFO rate must be selected to ensure that the period is positioned exactly between two reset signals, with the LFO synchronized with the MIDI clock.

Example: Triangle



- S/H

The LFO generates a new random value with each reset. The LFO Rate control does not have any effect in this case.

- $\wedge T$

The staircase voltage as described in 2.5.1 is reset to its minimum value with each reset. If one period of the triangle signal from which the staircase voltage was generated has elapsed, the LFO will remain at its minimum value.

- $\square T$

The staircase voltage as described in 2.5.1 is reset to its minimum value with each reset. If one period of the triangle signal from which the staircase voltage was generated has elapsed, the LFO will remain at its minimum value.

- AT

The staircase voltage as described in 2.5.1 is reset to its minimum value with each reset.

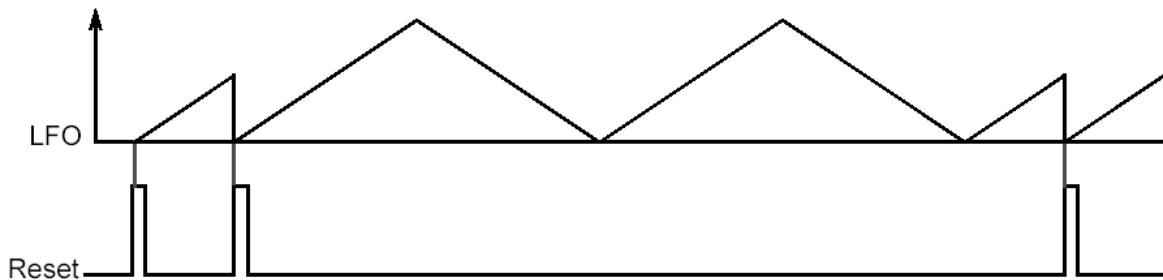
■ T

The LFO Reset is activated by trigger signals (selection: Trigger Source). A reset affects the various waveforms differently:

- $\wedge \nearrow \searrow \square$

The LFO runs continuously and starts at its minimum value when reset.

Example: Triangle



- S/H

The LFO generates a new random value with each reset. The LFO Rate control does not have any effect in this case.

- Other waveforms

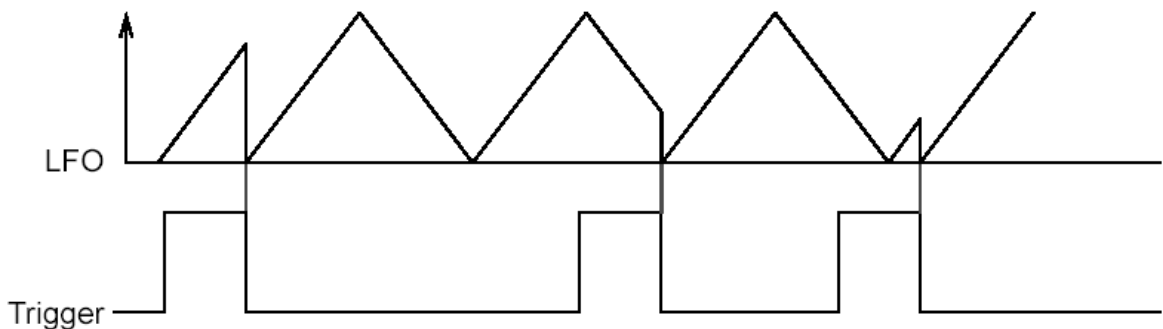
The LFO does not have any effect in this case.

■ TD

- $\wedge \nearrow \searrow \square$

The LFO runs continuously and starts at its minimum value when reset. The reset is activated at the end of the trigger (e.g. Trigger Source = MIDI: Note Off).

Example: Triangle



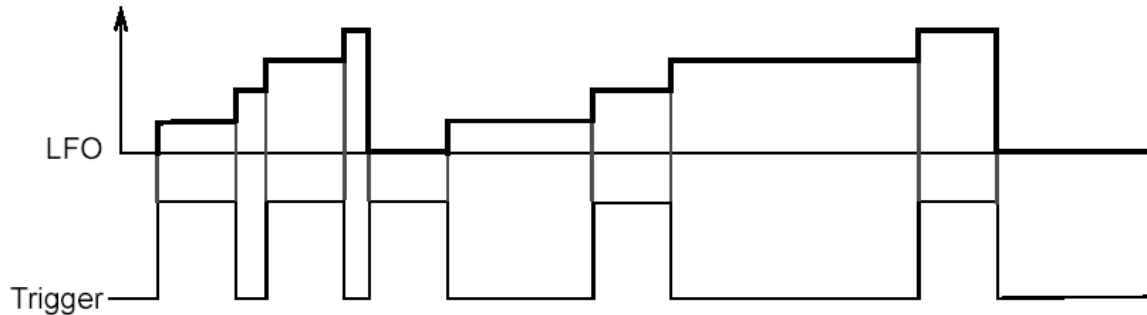
- S/H

The LFO generates a new random value at each start and end of a trigger. The LFO Rate control does not have any effect in this case.

○ $\wedge \top \Pi \top \text{AT}$

The staircase voltages as described in 2.5.1 change their values both at the start and end of a trigger.

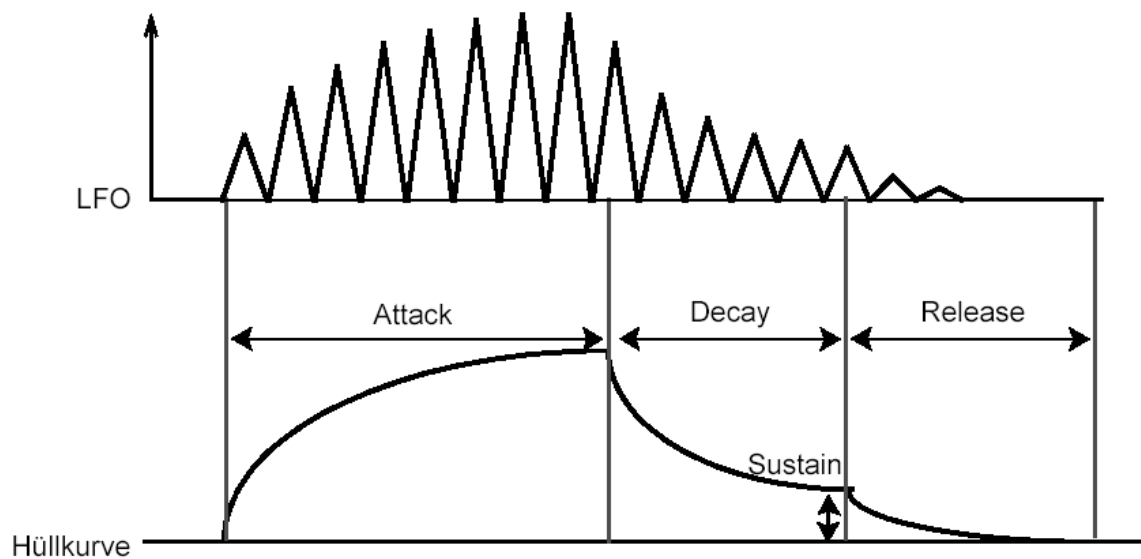
Example: AT



■ **EM**

The same waveforms result as described in 2.5.1 (LFO Reset: Norm). The LFO is not reset, but the LFO intensity will be influenced by both the LFO Depth control and the envelope voltage. For example, the LFO intensity increases in the attack phase and drops to the sustain level after the decay phase. The LFO intensity will be 0 at the end of the release phase.

Example; triangle LFO



■ Norm

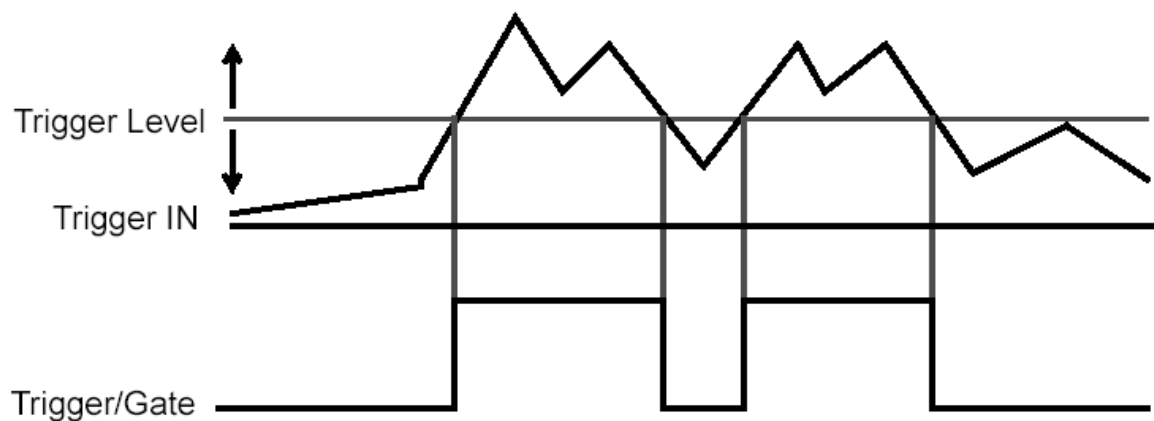
In Norm mode, the same waveforms result as described in 2.5.1. The LFO runs continuously and is not reset.

MIDI Reset

In Norm mode an LFO reset can also be triggered by a Control Change message (#114, any data value). In this case, the LFO behaves in the same way as in modes C2 - C32. For example, the LFO is reset to its minimum value and only one period is generated when using triangle, sawtooth, inverted sawtooth and square-wave waveforms. To return to the normal mode (LFO continuously on), set the LFO Reset control to a different mode and then back to the Norm position.

2.6 Analog Trigger

Either an audio signal applied to the TRIGGER INPUT socket or the filter input signal (TRIGGER INPUT socket open) can be used as an analog trigger signal to activate the envelope or generate the VCA gate voltage. The volume at which the analog trigger takes effect depends on the selected trigger level.



2.7 Output

■ Volume

Controls the output volume of the Warp 9. A high volume or an excessive input level can distort the signal. In this case, please lower the volume.

■ Distortion

The distortion effect is disabled when the switch is in the Off position. To enable the distortion at the output of the Warp 9, switch it on here. The strength of the effect depends on the volume setting.

■ Bypass

Switches between the filtered and original signal.

2.8 Program selection

The SINE WARP 9 features 32 program memory slots organized in 2 groups (A/B) of 16 programs each. The following data is stored in a program:

- Filter mode
- All Modulation 1 parameters
- ENV MOD, Cutoff and Resonance

The output settings (Volume, Distortion and Bypass) as well as the trigger levels cannot be stored. The MIDI send and receive channel is global and is therefore shared by all 32 programs. It can be stored together with the active program number that is loaded automatically when switching the device on.

2.8.1 Manual program selection

1. Press the Program button briefly until the Program LED starts to flash.
2. Press the Program button repeatedly until the desired program has been selected. Depending on the currently active program group A/B, either programs 1-16 (A active, LED A/B not lit) or 17-32 (B active, LED A/B lit) will be available for selection. The 4 LP/HP/BP/N LEDs serve as the display of one of the 16 program numbers within the active program group.
3. Selecting the program group A/B. Press and hold the Program button (approx. 1 second) to switch program groups. The following chart shows the status of the LEDs depending on the selected program number.

A/B	LP	HP	BP	N	Prog	A/B	LP	HP	BP	N	Prog
○	○	○	○	○	1	●	○	○	○	○	17
○	●	○	○	○	2	●	●	○	○	○	18
○	○	●	○	○	3	●	○	●	○	○	19
○	●	●	○	○	4	●	●	●	○	○	20
○	○	○	●	○	5	●	○	○	●	●	21
○	●	○	●	○	6	●	●	○	●	○	22
○	○	●	●	○	7	●	○	●	●	○	23
○	●	●	●	○	8	●	●	●	●	○	24
○	○	○	○	●	9	●	○	○	○	●	25
○	●	○	○	●	10	●	●	○	○	●	26
○	○	●	○	●	11	●	○	●	○	●	27
○	●	●	○	●	12	●	●	●	○	☹	28
○	○	○	●	●	13	●	○	○	●	●	29
○	●	○	●	●	14	●	●	○	●	●	30
○	○	●	●	●	15	●	○	●	●	●	31
○	●	●	●	●	16	●	●	●	●	●	32

2.8.2 Program selection via MIDI

Programs can be selected via MIDI using Program Change messages containing program numbers (1-32). Please note that Programm Change messages will only be accepted if they are sent on the send and receive channel of the SINE WARP 9.

2.9 Copying and saving programs

Individual parameters of a program that have been changed will be lost when choosing a new program or switching the device off. Parameter changes to a program must be saved if you intend to keep them.

- Saving a program
 - Press the Write button briefly until the Write LED is lit.
 - Press the Write button again. All parameter changes to the currently selected program will be saved. After the program has been saved, the program selection function will be activated automatically.
- Copying a program
 - Press the Program button briefly to select the program to copy.
 - Press the Write button briefly until the Write LED is flashing.
 - Press the Program button briefly (the Write LED will continue to flash) to select the target program within the current program group, or hold the Program button to select a target program group (A/B). The target program will be displayed as described in 2.8.
 - Press the Write button to copy the program. After the program has been copied, the program selection function will be activated automatically.

Note: Press the Channel or Mode button to cancel the copy operation.

2.10 MIDI send and receive channels

The SINE WARP 9 sends and receives the following channel-dependent MIDI data:

- Program Change messages for program selection (receive)
- Note On/Note Off for envelope triggering (receive)
- Control Change messages for parameter changes (send and receive)

A shared send and receive channel can be selected at the SINE WARP 9 for sending and receiving data.

2.10.1 Setting the send and receive channel

- Press the Channel button briefly until the Channel LED starts to flash.
- Press the Channel repeatedly to increment the MIDI channel upward by 1 (selection: 1-16). The 4 LP/HP/BP/N LEDs serve to display the MIDI channel.

LP	HP	BP	N	Channel
○	○	○	○	1
●	○	○	○	2
○	●	○	○	3
●	●	○	○	4
○	○	●	○	5
●	○	●	○	6
○	●	●	○	7
●	●	●	○	8
○	○	○	●	9
●	○	○	●	10
○	●	○	●	11
●	●	○	●	12
○	○	●	●	13
●	○	●	●	14
○	●	●	●	15
●	●	●	●	16

2.10.2 Saving the send and receive channel

The channel setting must be saved to retain it from one session to another. This will also save the active program number, i.e. the program number that will be loaded automatically when switching the device on.

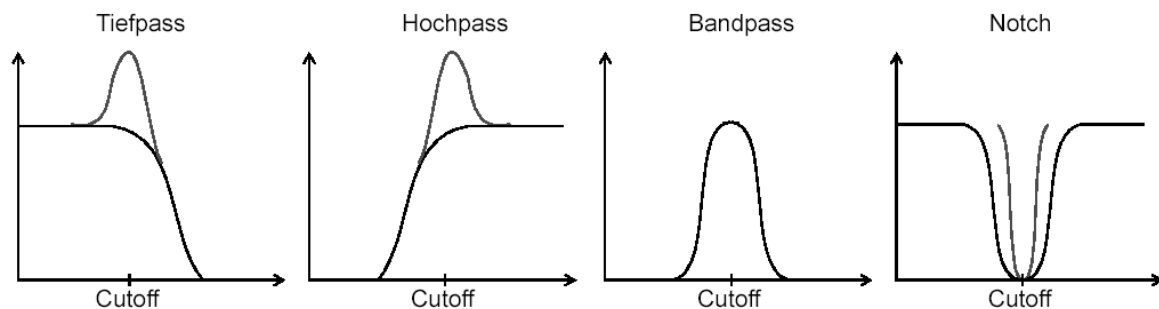
- Press the Write button briefly until the Write LED is lit. The settings have now been saved.
- Press the Program, Channel or Mode button to exit the Write function.

2.11 Filter mode

The Filter of the SINE WARP 9 works in the following modes:

- Low-pass (LP)
- High-pass (HP)
- Band-pass (BP)
- Notch filter (N)

The frequency responses of the individual filter types are depicted below. The low-pass filter lets all frequencies below the cutoff frequency pass and suppresses higher frequencies. The high-pass filter lets all frequencies above the cutoff frequency pass and suppresses lower frequencies. The bandpass filter only lets signals around the cutoff frequency pass. The notch filter suppresses the frequency range around the cutoff frequency. The frequency response around the cutoff frequency varies depending on the resonance (dotted line corresponds to the filter with high resonance).



Selecting the filter mode

- Press the Mode button briefly until the Mode LED starts to flash.
- Press the Mode button until the desired filter mode is displayed.

LP	HP	BP	N	Mode
●	○	○	○	Low-pass
○	⊗	○	○	High-pass
○	○	⊗	○	Band-pass
○	○	○	⊗	Notch

3 MIDI control

The SINE WARP 9 sends and receives the following MIDI data:

- Program Changes (1-32, reception only on the active receive channel)
- Midi Clock (for LFO reset)
- Note On/Off (for ENV/VCA triggers, reception only on the active receive channel)
- Control Changes (sending and reception only on the active receive channel)

If a parameter is modified by changing one of the controls, the SINE WARP 9 will send an appropriate control-change message to the MIDI OUT which can then be recorded by a MIDI sequencer. If these controller messages are sent back to the SINE WARP 9, the parameter will be set according to the value. The following table provides an overview of the parameters and the associated controller messages sent and received via MIDI.

Parameter	Controller number	Controller values
ENV mode	103	0 – 127
Cutoff	104	0 – 127
Resonance	105	0 – 127
Attack	106	0 – 127
Decay	107	0 – 127
Sustain	108	0 – 127
Release	109	0 – 127
Delay	110	0 – 127
LFO rate	111	0 – 127
LFO depth	112	0 – 127

Controller value 0 corresponds to the control knob in the minimum position.

Controller value 127 corresponds to the control knob in the maximum position.

- Controller Changes (reception only on the active receive channel)

Parameter	Controller number	Controller values
VCA control	113	0 – 127
LFO reset:	104	0 – 127
Filter mode	105	0 – 127
Modulation wheel	106	0 – 127

4 Modulation 1

This section is organized in the 3 parameter groups Select 1, Select 2 and Select 3. Use the Select button to select one of the 3 parameter groups. You can then edit the individual parameters within the group with the above control knobs.

When switching to a different parameter group while editing parameters, the positions of the control knobs will still show the values of the previous group, even if the parameters of the current group have completely different values. The parameter will not take on the value shown by the control knob until you move the knob. An example: suppose you have chosen Select 2 and set the Attack value to minimum. Next, you choose Select 3 and set the LFO Rate to maximum. If you go back to Select 2, the control knob will be set to maximum, but the Attack value will still be at minimum. If you now move the control knob, the Attack value will change to the current position of the control knob.

The control knobs of the 3 parameter groups have different value ranges. The values on the labels of the front panel of the Warp 9 apply to the Select 1 parameters.

Select 1:

1	ENV Mode	VCA Mode	ENV Trigger	LFO Wave	LFO Reset
2	Attack	Decay	Sustain	Release	Delay
3	LFO Rate	LFO Depth	KEY Follow	Velocity	Modulation

Select 2:

1	ENV Mode	VCA Mode	ENV Trigger	LFO Wave	LFO Reset
2	Attack	Decay	Sustain	Release	Delay
3	LFO Rate	LFO Depth	KEY Follow	Velocity	Modulation

Select 3:

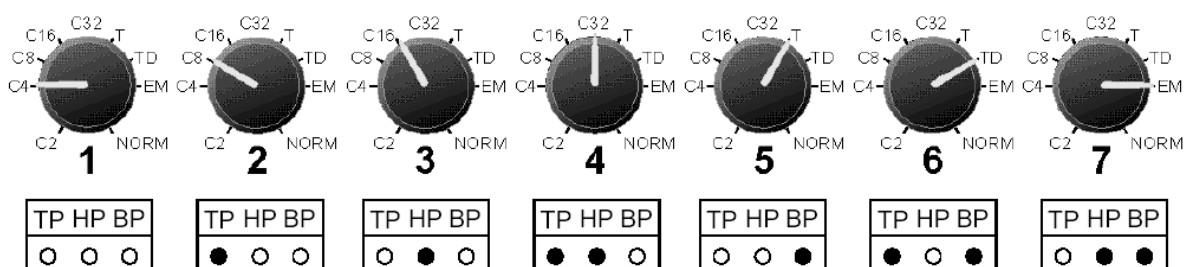
1	ENV Mode	VCA Mode	ENV Trigger	LFO Wave	LFO Reset
2	Attack	Decay	Sustain	Release	Delay
3	LFO Rate	LFO Depth	KEY Follow	Velocity	Modulation

5 Appendix

5.1 Select 1 potentiometer calibration

If the valid positions of the Select 1 parameters (a value is recognized as valid when the Select 1 LED is not flashing) do not correspond to the control knob increments on the front panel of the Warp 9 (after a control knob has been replaced, for example) you may set and permanently store the positions recognized as valid. Proceed as follows:


- When switching the device on, press and hold the Program and Write buttons at the same time. The Select and Trigger LEDs must remain lit. The LP, HP and BP LEDs are not lit.
- The various valid control knob positions can be calibrated without the left and right values. When calibrating, set all 5 control knobs to one of 7 possible positions. These 7 possible positions are shown below using the LFO Reset control as an example.
- Turn all 5 control knobs below Modulation 1 to position 1. All controls should be positioned so that they point exactly at the second value (LFO Reset knob on C4, LFO Wave on Sawtooth, ENV Mode on N2). The Trigger Source and VCA Mode controls should also be in these positions, even though they do not have values at this point,
- Save this position by pressing the Write button.
- To set the next position (2), press the Program button briefly. The LP, HP and BP LEDs will now light as shown below under Position 2. Next, set all 5 controls in Position 2 so that they point exactly at the third value (LFO Reset: C8, LFO Wave: , ENV mode: N3). The ENV Mode and VCA Mode controls should also be in this position.
- Save this position by pressing the Write button.
- Repeat this process for the remaining positions 3 to 7, i.e. press the Program button first to select the next position in accordance with the LEDs, set all knobs to the position and save the control positions with the Write button.



- After saving Position 7, press the Channel button to exit the calibration mode.
- To check whether the calibration has been performed correctly, choose Select 1 and set the controls to the position of the various values. The Select LED must remain lit (value recognized). The value is invalid if the LED flashes between two values.

5.2 Initializing programs

All 32 programs can be saved with the following preset values:

MIDI channel: 1
Filter mode: Low-pass (LP)
Trigger source: AT (analog trigger)
ENV mode: N1 (trigger envelope at beginning of trigger)
VCA mode: On (VCA permanently on)
LFO wave:  (triangle)
LFO reset: Norm (no reset)
LFO depth: 0
MIDI modulation: Velocity, Key Follow, Modulation Wheel: OFF

When switching the device on, press and hold the Channel and Mode buttons at the same time. The 32 programs will be initialized one at a time. The process is complete when the Prog LED starts to flash. The Warp 9 will then be in normal operating mode.

Service at TerraTec Producer

Sometimes, no matter how good the weather is, things do not always work as they should. Problems can arise in the best studio systems. If this happens to you, the TerraTec Producer team is happy to offer its service and support.

Internet, Hotline

If you have a tough problem—where you cannot solve the problem yourself, the support in this manual doesn't resolve the problem, and your dealer can't fix it either—please contact us directly.

If possible, try our Internet support system first: under <http://www.terratec.com/> you will always find current answers to frequently asked questions (FAQ).

If these options do not provide the necessary help, please contact our phone hotline. You can also reach us online.

To do so, visit us at <http://supporten.terratec.net/>.

In either case, please have the following information handy:

- your registration number
- this documentation.

In addition, it would be helpful to our technicians if you are at your device during the phone call to directly carry out tips and tricks. Please do not forget to write down the name of the respective support technician if you contact our Support Team. You will need this name if a defect is present and your device needs to be mailed to us.