

# Lightwave

## Introduction

### Interface

#### The Main surface

##### OSC1/2

OSC1/2

##### Mix Section

##### VCF Section

VCF

VCF 1/2

Filter Env

##### Amp Section

Amp

Amp Env

#### The Mod surface

##### LFO1/2 Section

LFO1/2

##### Free Env Section

Slopes

##### MIDI Section

##### Global Section

Tune

Porta



NOAH

- Tactive Instrument Modeller

creamw@re<sup>©</sup>

fidelity at work.

# Introduction

With Lightwave you now possess a highly sophisticated synthesizer that lets you create whole new worlds of sound easily and intuitively—from simple synth and layered sounds to complex, dynamic stereo sounds.

To produce its sounds, Lightwave employs two wavetable oscillators equipped with the wave shaping technology of the legendary Prophet VS. The oscillator signals are combined in the mix section, and routed as desired through two 12dB multi-mode filters. The filters can be configured either in series or in parallel.

In series mode the filters combine to produce slopes of up to 12dB or 24dB/octave if the filters are of the same type. Use filters of different types to create new, complex filter types. In parallel mode you can send the signal from each oscillator to its own filter for creating layered sounds.

Two independent pan modulators in the amplifier section make the creation of spacious stereo effects child's play.



With Lightwave you can apply modulation to all important parameters. In addition to the two LFOs and the multi-stage envelope generator you can use almost any MIDI controller as a modulation source.

## Interface

Lightwave's interface consists of two switchable panels—a main panel and a modulation panel (**Main** and **Mod**). Each panel in turn comprises different sections arranged to indicate the general structure of the signal path.

The **Main** panel contains the oscillators, the mix section (mixing, routing), the filters and their envelope generator, the amplifier section (level, pan) and the amplifier's envelope generator.

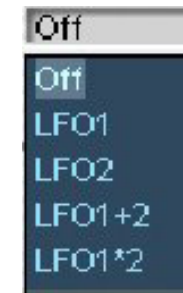
The **Mod** (modulation) panel contains the modulation sources, effects, a freely assignable envelope generator, and some global parameters.



Use the buttons to the right of the Lightwave logo to switch between the two panels.

The rotary controls are color coded. Blue controls are used to set fixed values. A text box, in which you can type a value, accompanies these controls and indicates the setting's current value. Green controls adjust modulation depth and direction. With many of these controls you can select the modulation source from an associated drop-down list. The source and target (control label, if present) and the depth and direction of the modulation are all displayed along with the control.

For all modulation controls the following sources are available: LFO1, LFO2, LFO1+2, LFO1\*2, LFO1\*MW, LFO1\*AT, LFO2\*MW, LFO2\*AT, Filter Env, Amp Env, Free Env+, Free Env-, Keyfollow, Velocity, Aftertouch, Mod.Wheel.



## The Main surface

### OSC1/2

Oscillators 1 and 2 are wavetable oscillators equipped with the waveshaping technology of the Prophet VS. This is the oscillator also used by CreamWare's successful Vectron synthesizer.

For each oscillator you can select from a pool of 128 waveforms. A Grunge control adjusts the tone quality from soft and warm, to hard and bright (overtone-rich). The pitch modulation is individually adjustable for each oscillator.

### OSC1/2

#### Waveform

Use this control to select one of the 128 available waveforms. The Noise waveform is unusual in that its sonic character is influenced by the Coarse/Fine controls. This is not normally the case with noise waveforms.



#### Coarse/Fine

Controls the pitch of the oscillator. Coarse adjusts the pitch in semitones; Fine adjusts it in cents (1/100 of a semitone).

#### Grunge

Adjusts the timbre of the signal from soft and warm to hard and bright by adding overtones. For the most part the overtones are created by increasing the distortion caused by aliasing, which, in this case, achieves a desirable effect.

#### Pitch Modulation

Selects the pitch modulation source and controls the intensity and direction of the modulation.

## Mix Section

As you would expect, the Mix section combines the oscillator output signals. You can also apply modulation to the volume level of each oscillator. The balance controls let you route proportions of each oscillator signal to the two filters. In the center position, the signal is sent to the two filters in equal proportion. At the hard left position the signal is sent only to Filter1, and at hard right, only to Filter2. Depending on the configuration of the filters—serial or parallel—and the selected filter types, innumerable sonic variations are possible. A Gain control sets the level of the pre-filtered oscillator mix signal.



### Oscillator1/2

Sets the volume level of the respective oscillator.

### Oscillator1/2 Modulation

Controls the level modulation depth and direction. Select the modulation source from the associated drop-down list.

### Balance1/2

Controls the routing of the OSC1 and OSC2 signals to the filters.

### Balance1/2 Modulation

Controls the balance modulation depth and direction. Select the modulation source for controlling the signal distribution from oscillators to filters 1 or 2 from the associated drop-down list.

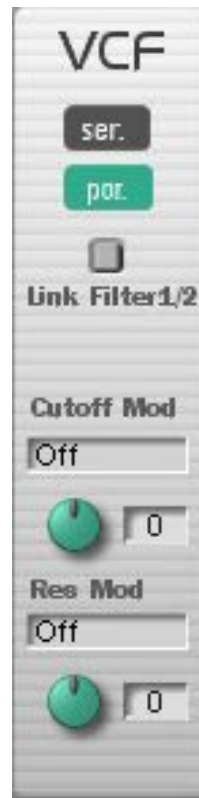
## VCF Section

The Filter section provides two multimode filters with a slope of 12dB/octave and adjustable resonance. Each filter is configurable as lowpass, highpass, or bandpass. A Thru function switches the filters to bypass. The filters can be configured either in series or in parallel. Cutoff and Resonance can be modulated separately. The two filters share a common envelope generator.

### VCF

#### Serial/Parallel

Switches the filters to a serial or parallel configuration. If you set the two filters to the same filter type in serial configuration the effect of the filter is summed, and the slope increases to 24dB/octave.



#### Link Filter 1/2

This option links the Filter1 and Filter2 controls so that they operate in tandem. This is especially useful when the filters are configured in series to create, in effect, a single 24dB/octave filter.

#### Cutoff Mod

Controls the cutoff modulation depth and direction. Select the modulation source from the associated drop-down list.

#### Res Mod

Controls the resonance modulation depth and direction. Select the modulation source from the associated drop-down list.



## VCF 1/2

### Type

The filters are switchable to operate as highpass, bandpass, or lowpass filter. When set to Thru the filters are bypassed.

### Cutoff

Adjusts the cutoff frequency relative to a range of 0..127.

### Resonanz

Adjusts the resonance relative to a range of 0..127.

### Keyf

This parameter allows the filter cutoff to track the keyboard through the MVC. The keyfollow mid-point is fixed at MIDI note #64 (E3). At this note, the cutoff frequency will always stand at its original value, regardless of the key follow setting. When keyfollow is set to 100%, the cutoff frequency will adjust to maintain its frequency relationship to the pitch across the entire keyboard. At a setting of 50%, the cutoff frequency ratio will be lowered



by 50% per octave above E3, and raised 50% per octave below E3. A value of 0% means there is no keyfollow modulation, and the cutoff frequency remains fixed. If key follow is set to 200%, the cutoff frequency increases or decreases twice as fast as the pitch of the note played. Negative values invert the sense of the modulation - higher notes yield a lower cutoff frequency and vice versa.

### Env

Adjusts intensity and direction of envelope-modulation.

### Cutoff Mod

Controls the cutoff modulation depth and direction. Select the modulation source from the associated drop-down list.

### Res Mod

Controls the resonance modulation depth and direction. Select the modulation source from the associated drop-down list.

## Filter Env

### A

The attack time. When a gate signal is received, the attack segment starts, and continues for the slope time at which point the maximum level is reached.

### D

The decay time. The envelope enters the decay segment when the attack phase completes, and the modulation falls back to the sustain level. The time needed for this is the decay time. A decay will not be heard if the sustain level is set to maximum.

### S

The sustain level. This is the level at which the modulation signal will be held as long as the gate is open. When the gate closes, the release segment immediately follows.



### R

The release time. When the envelope generator receives a gate-off signal, it jumps immediately from its current phase to the release stage. When the change from one segment to another takes place, the release time will be adjusted to account for the volume level at that time.

### TKf (Time Keyfollow)

Adjusts the times of all segments of the envelope. Both the intensity and direction of the modulation effect through MIDI-Note-Number is set by this value. Negative values shorten times, and positive values lengthen them.

### TVel

Adjusts the times of the three envelope segments. Both the intensity and direction of the modulation effect through velocity is set by this value. Negative values shorten times, and positive values lengthen them.

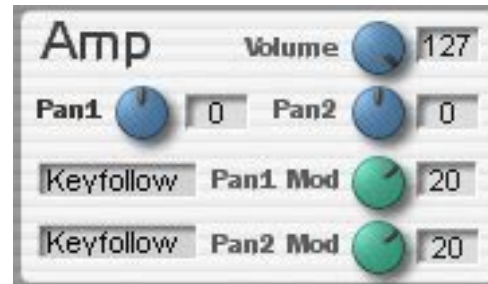
### LVel

Adjusts the levels of all segments of the envelope. The value here (0..max) controls the intensity of the modulation of the levels by velocity.



## Amp Section

The Amp section consists of two modulatable pan controls and an amplifier with its own envelope generator. Pan1 is permanently assigned to the output from Filter1, and Pan2 to Filter2. This implies that Pan1 has an effect only when the filters are switched to parallel mode. Or, to put it another way, Pan2 alone is used in serial mode. Volume controls the overall signal level.



### Amp

#### Pan1/2

Controls the position of the respective signal in the stereo field. Pan1 controls the signal from Filter1, and Pan2 the signal from Filter2.

#### Pan1/2 Modulation

Controls the depth and direction of the pan modulation. Select the modulation source for controlling pan position from the associated drop-down list

### Volume

The overall volume can be set here. When playing with high polyphony distortion can occur. Turn down the volume to avoid this.

## Amp Env

### A

The attack time. When a gate signal is received, the attack segment starts, and continues for the slope time at which point the maximum level is reached.

### D

The decay time. The envelope enters the decay segment when the attack phase completes, and the modulation falls back to the sustain level. The time needed for this is the decay time. A decay will not be heard if the sustain level is set to maximum.

### S

The sustain level. This is the level at which the modulation signal will be held as long as the gate is open. When the gate closes, the release segment immediately follows.

### R

The release time. When the envelope generator receives a gate-off signal, it jumps immediately from its current phase to the release stage. When the change from one segment to another takes place, the release time will be adjusted to account for the volume level at that time.



### TKf (Time Keyfollow)

Adjusts the times of all segments of the envelope. Both the intensity and direction of the modulation effect through MIDI-Note-Number is set by this value. Negative values shorten times, and positive values lengthen them.

### TVel

Adjusts the times of the three envelope segments. Both the intensity and direction of the modulation effect through velocity is set by this value. Negative values shorten times, and positive values lengthen them.

### LVel

Adjusts the levels of all segments of the envelope. The value here (0..max) controls the intensity of the modulation of the levels by velocity.

# The Mod surface

## LFO1/2 Section

Two full-featured LFOs serve as possible modulation sources for several parameters in the synthesizer. The LFOs are monophonic, and can be synchronized to a MIDI clock.



### LFO1/2

#### Rate

The frequency/rate of the modulation. The frequency, in cycles per second, is displayed in an associated text field.

#### Waveform

Selects the desired waveform.

#### Retrig

This switch determines whether the signal will run continuously, or be restarted at its initial phase setting each time a new note is played. Retrigger is active when the button is lit.

#### Phase

Determines the position within the waveform (phase) at which the signal will start when a gate signal is received. Retrigger must be enabled for this to take effect.

#### Delay

Delays the onset of the modulation. The range is from 0 to 20 seconds.



### FIn (Fade In)

When a gate signal is received, the modulation will gradually build to maximum at the time set here. A gate signal must be connected. The range is from 0 to 20 seconds.

**Between the fade in and the fade out, the modulation remains at maximum.**

### FOut (Fade Out)

When a gate off signal is received, the modulation will gradually fade to 0 at the time set here. A gate signal must be connected. The range is from 0 to 20 seconds.

### Keyf

This parameter allows the Rate (frequency) to track the keyboard. The keyfollow midpoint is fixed at MIDI note #64 (E3). At this note, the LFO frequency will always stand at its original value, regardless of the key follow setting. When keyfollow is set to 100%, the LFO frequency adjusts to maintain its relationship to the pitch across the entire keyboard as it follows the pitch. At a setting of 50%, the frequency ratio will be lowered by 50% per octave above E3, and raised 50% per octave below E3. A value of 0% means there is no keyfollow modulation, and the LFO rate remains fixed. If key follow is set to 200%, the LFO frequency increases or decreases twice as fast as the pitch of the note played. Negative values invert the sense of the modulation - higher notes yield a lower LFO frequency and vice versa.

### MIDI

Switches on MIDI clock synchronization. The Rate value disappears from the display and is replaced by a popup menu with a selection of musical note values.

### RMod1/2 (Rate Modulation LFO1/2)

Controls the rate modulation depth and direction of the LFO. Select the modulation source from the associated drop-down list.

### Lev Mod (Lev Modulation)

Controls the level modulation depth and direction of the LFO. Select the modulation source from the associated drop-down list.

## Free Env Section

The Free Env is another envelope generator you can use as a modulation source. The assignment of this envelope generator is not pre-defined. Instead, you assign it using the modulation matrix (see below).

### TKf (Time Keyfollow)

Adjusts the times of all segments of the envelope. Both the intensity and direction of the modulation effect through MIDI-Note-Number is set by this value. Negative values shorten times, and positive values lengthen them.

### TVel

Adjusts the times of the three envelope segments. Both the intensity and direction of the modulation effect through velocity is set by this value. Negative values shorten times, and positive values lengthen them.

### LVel

Adjusts the levels of all segments of the envelope. The value here (0..max) controls the intensity of the modulation of the levels by velocity.



### A

The attack time. When a gate signal is received, the attack segment starts, and continues for the slope time at which point the maximum level is reached.

### D

The decay time. The envelope enters the decay segment when the attack phase completes, and the modulation falls back to the sustain level. The time needed for this is the decay time. A decay will not be heard if the sustain level is set to maximum.

### S

The sustain level. This is the level at which the modulation signal will be held as long as the gate is open. When the gate closes, the release segment immediately follows.

### R

The release time. When the envelope generator receives a gate-off signal, it jumps immediately from its current phase to the release stage. When the change from one segment to another takes place, the release time will be adjusted to account for the volume level at that time. ausgehend vom letzten Level.

## Slopes

### AT

Adjusts the slope curve for the attack phase. The curve is continuously adjustable from linear to logarithmic.

### D/R

Adjusts the slope curve for the decay/release phases. The curve is continuously adjustable from a linear to an exponential fade out.

## MIDI Section

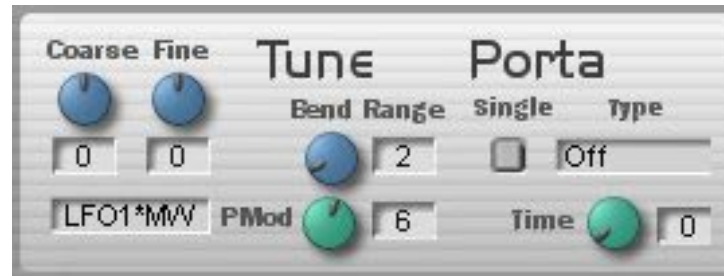
In this section you can control the modulation wheel with the mouse.





## Global Section

The Global section contains some basic instrument settings. Here you choose whether or not to use portamento, and adapt the response of the instrument to your playing by selecting different velocity and aftertouch curves.



### Tune

#### Coarse/Fine

Coarse transposes the pitch in semitones, while Fine adjusts it in *cents* (hundredths of a semitone).

#### Bend Range

The Pitch Wheel Range setting controls the deflection of the pitch by the incoming pitchwheel values. The range is adjustable from 0 to 24 semitones. The pitchwheel has no effect, of course, if the value here is set to zero.

### Porta

#### Porta/Glis (Type)

When Portamento or Glissando is switched on, the pitch will either glide (Portamento), or progress in a stepwise sequence (Glissando), from one note to the next over a fixed time period (adjustable - see next section).

You can adjust this parameter to **Off**, **Portamento (P)**, **Glissando (G)**, **fingered Portamento (fP)** or **fingered Glissando (fG)**. Note that Portamento/Glissando is only effective when playing in a legato style.

#### Time

Used in conjunction with the Port/Gliss option, above. This sets the amount of time to glide or gliss from one note to the next.

#### Single

Forces the instrument to operate in single-voice mode, regardless of how many voices are actually currently loaded. Guarantees proper performance of solo sounds with portamento.

#### Pitch Modulation (PMod)

Controls the pitch modulation depth and direction for both OSCs. Select the modulation source from the associated drop-down list.

# Index

## A

Amp 9  
Amp Env 10  
attack 10

## B

Balance 5  
Bend Range 15

## C

Coarse 4, 15  
Cutoff 7, 8  
Cutoff Mod 6, 7

## D

D 8  
decay 10  
Delay 11

## E

Env 7

## F

Fade In 12  
Fine 4, 15  
fingered Glissando (fG) 15  
fingered Portamento (fP) 15  
Free Env 13  
Free Env Section 13

## G

Glissando (G) 15  
Global 15  
Grunge 4

## I

Init Phase 12  
Interface 3

## K

Keyf 7

## L

LFO 11  
Link Filter 6  
Lmod 8  
Lvel 10, 13

## M

MIDI 14  
Mix 5  
Modulation 5, 9

## O

OSC1/2 4  
Oscillator 5

## P

Pan 9  
Parallel 6  
Pitch Modulation 4, 15  
Pitch Wheel Range 15  
Portamento (P) 15

## R

R 8  
Rate 11  
release 10  
Res Mod 6, 7  
Resonanz 7  
Retrig 11  
Rmod1 12

## S

S 8  
Serial 6  
Single 15  
sustain 10

## T

Time 15  
Time Keyfollow 8  
TKf 8, 10  
Tmod1 13  
Tmod2 8, 10, 13  
Tune 15  
Type 7

## V

VCF 6  
Volume 9

## W

Waveform 4, 11