

Lightwave

Introduction

Interface

OSC1/2

Mix Section

VCF-Section

VCF

VCF 1/2

Filter Env

Amp Section

Amp

Amp Env

LFO Section

LFO1/2

Free Env

MIDI Section

Effect-Section

Chorus

Delay L/R

Global Section

A note about
modulations in
Lightwave

Index



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 effects.

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.

An effects section, consisting of a chorus and delay, completes the professional feature set of the Lightwave synthesizer.



Interface

Lightwave's interface consists of two switchable panels—a main panel and a modulation panel. 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.

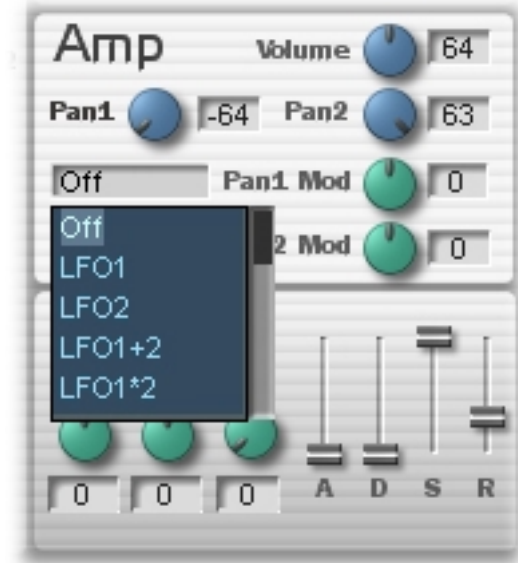
The Mod (modulation) panel contains the modulation sources, effects, a freely assignable envelope generator, and some global parameters.

Use the buttons to the right of the Lightwave logo to switch between the two panels. When the Mod panel is selected,

the Chorus and Delay buttons switch between the respective effect controls.

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.



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.

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.

Lmod

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.

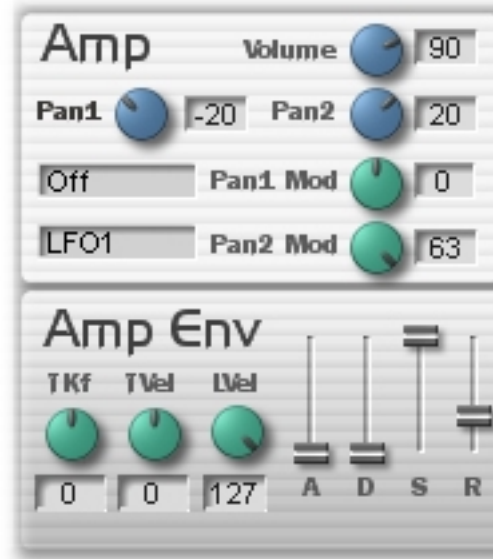
Amp

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.

Lmod

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.

LFO 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.

Init 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.

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.

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 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 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.

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 (that is, 1/4 note, 1/8 note, etc.) that represent one period of the LFO waveform.

Rate 1/2 Modulation LFO1/2

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

Lev Modulation LFO1/2

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

Free Env

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).



Free 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. ausgehend vom letzten Level.

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.

Lmod

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 Slope

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

D/R Slope

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



MIDI Section

In this section you can set the receiving MIDI channel, and control the modulation wheel with the mouse. This is also where you set the MIDI clock rate or select external synchronization.

MIDI

Channel

Selects the MIDI Channel.

BPM

Sets the clock tempo BPM (Beats Per Minute). The first field is the whole number value, and the second is the fractional value in 1/100ths of a beat per minute.

internal/external

Switches from internal to external synchronisation.

Effect-Section

The Effect-Section delivers you Chorus and Delay. The Delay-Times are MIDI-clockable.

Chorus

Rate

Controls the frequency of the pitch modulation.



Depth

Adjusts the modulation depth - the strength of the pitch modulation.

Phase

Adjusts the phase difference of the modulation signal between the left and right channels. This influences the 'width' of the stereo field.

Dry/Wet

Determines the relation between the level of the original and the effect signal.

Bypass

Sends the input signal directly to the output, bypassing the effect.



Delay L/R

TimeL/R

Adjusts the delay time, in milliseconds, for the left and/or right channels.

FB

Controls how much of the delayed signal is fed back to the inputs to be delayed once again.

Damp

Adjusts the amount of high frequency filtering applied to each cycle of the signal in the feedback loop.

MIDI

Activates MIDI-Clock synchronisation. The time parameters are replaced by popup menus where you can choose a note length as delay time.

Cross

This switch changes the feedback loop to a Cross Feedback loop: The output of the left channel is fed back to the right channel input, and the right channel output is routed to the left input channel.

Dry

Controls the level of the original signal in the output.

Wet

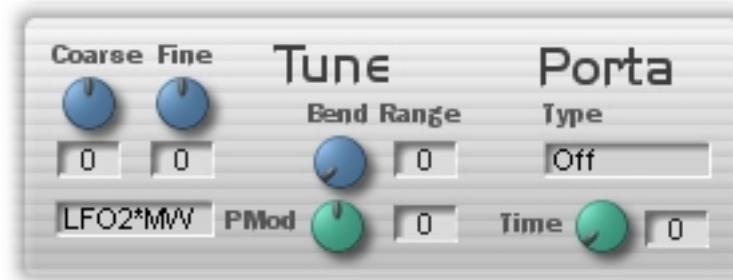
Controls the level of the delayed signal in the output.

Bypass

Routes the signal directly from the input to the output, bypassing the effect.

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).

PWR

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/Glis

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.

Pitch Modulation

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

Velocity/Aftertouch Curve

The illustration shows the 128 possible Velocity/Aftertouch values.

The associated parameters Curve, Sensitivity, and Offset all contribute to the way the MVC adapts the Velocity/Aftertouch values to produce the desired response. The fundamental response is determined by the 7 Curves - linear (curve 1), fixed (curve 3), exponential (curve 4) or logarithmic (curve 6). Sensitivity adjusts the depth of the curve (i.e. the degree of response) and Offset adds or subtracts a fixed amount from the response curve.

Curve

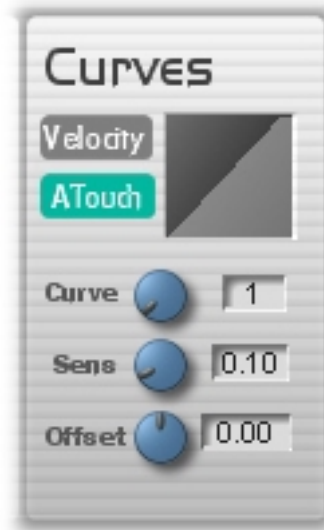
Select one of the curves in the graphic to define the basic behavior.

Sensitivity

Adjusts the upward slope of the curve, and the resulting output values as displayed in the graphic.

Offset

Adds or subtracts the value set here.



A note about modulations in Lightwave

To conserve system overhead, the Lightwave synthesizer's LFOs are monophonic. Modulating polyphonic targets with a monophonic source is not a problem. However, to modulate a monophonic target with a polyphonic source, the source signals (of which there is one for each voice) must first be merged. In Prisma, this merging takes place automatically. Depending on the number of voices in the mixer, only enough headroom remains such that only during full utilization of the voices will the maximum modulation range be achieved. Thus the modulation behaves somewhat differently depending on the number of voices in play in order to maintain an even dynamic.

Index

A

Aftertouch 16
Amp 9
Amp Env 9
attack 9

B

Balance 5
BPM 13
Bypass 14

C

Channel 13
Chorus 13
Coarse 4, 15
Cross 14
Curve 16
Cutoff 7, 8
Cutoff Mod 6, 7

D

D 8
Damp 14
decay 9
Delay 11
Delay L/R 14
Depth 14
Dry/Wet 14

E

Effect 13
Env 7

F

Fade In 11
Fade Out 11
FB 14
Filter Env 8
Fine 4, 15
fingered Glissando (fG) 15
fingered Portamento (fP) 15
Free Env 12

G

Glissando (G) 15
Global 15
Grunge 4

H

HiDamp 14

I

Init Phase 11
Interface 3
internal/external 13

K

Keyf 7, 11

L

Lev Modulation 11
LFO 10
Link Filter 6
Lmod 8, 10, 12

M

MIDI 13, 14
Mix 5
Modulation 5, 9

O

Offset 16
OSC1/2 4
Oscillator 5

P

Pan 9
Parallel 6
Phase 14
Pitch Modulation 4, 15
Pitch Wheel Range 15
Portamento (P) 15
PWR 15

R

R 8
Rate 10, 11, 13
release 9
Res Mod 6, 7
Resonanz 7
Retrig 11
Rmod1 11

S

S 8
Sensitivity 16
Serial 6
Slope 13
sustain 9

T

Time 15
Time Keyfollow 8
TimeL/R 14
TKf 8, 10

Tmod1 12
Tmod2 8, 10, 12
Tune 15
Type 7

V

VCF 6
Velocity 16
Volume 9

W

Waveform 4, 10
Wet 14