Prosoniq Magenta

Realtime Resynthesis Plugin for VST

Welcome to the Prosoniq Magenta software for VST. Magenta is a novel extension for your VST aware host application that brings the power and flexibility of realtime resynthesis to your multitrack recording environment. Designed with both sound design power and performance in mind, Prosoniq Magenta uses your computer's processor to its fullest extent.

Introduction:

What is it and what does it do?

Magenta is, to put it simple, a software synthesizer without built-in sounds. Instead, it uses any sound that is fed to it as basic waveform that is processed by all subsequent stages of its powerful synthesizer unit. These include an LFO section, an envelope generator, pitch, panorama and volume controls and the Magenta filter section. We will cover this in depth later below. All key parameters can be controlled through a set of MIDI controllers, such as velocity, modulation wheel, pitch bend, aftertouch and other. In addition, Magenta offers full support for automation, which allows you to automate all of its parameters through your host software's effects automation capabilities.

Basic facts:

What is resynthesis?

All standard synthesis varieties, such as subtractive synthesis (as is widely used in analog synthesizers) or Frequency Modulation (FM, a common synthesis concept from the 1980s) consist of a sound source (an "oscillator") that is filtered and/or modulated in subsequent stages, and controlled

through envelopes and LFO generators to shape its final sound. Both subtractive synthesis and FM synthesis typically rely on very simple, constant waveforms in their oscillators to produce the basic sound, and are therefore limited in the range of sounds they can actually produce. They apply very simple mathematic calculations such as filtering to the sound, which changes the sounds' quality but still retains much of the properties of the original waveform. They are therefore limited in the range of sounds they can produce, as they just apply some changes to the sound without actually "understanding" it. Also, FM is a synthesis form known to be very difficult to operate, as a small change in the synthesis parameters may lead to a dramatic change in sound and results of parameter tweaking are almost unpredictable. Sampling, and other synthesis forms such as wavetable synthesis, have tried to address the problem by providing more complex sources for manipulation, yet the restrictions of subtractive and FM synthesis still apply. And after all there is much more to sound design than filtering a signal.

Resynthesis, which is a special form of a process called "additive synthesis", on the other hand, combines all traditional synthesis forms (both subtractive and FM synthesis are possible with it, as well as a wealth of others) with a musically useful representation of sound. Additive Synthesis is based on a mathematical property of waves discovered by Jean-Baptiste Joseph Fourier. Fourier discovered that any given waveform, however complex, can be represented by a sum of sinusoid (which means sine-like) waves of different frequencies. Resynthesis, which is a special form of that process, consists of two stages: a sound is analyzed and all its partial frequencies, such as the fundamental frequency of the sound and its overtones are derived from it. This is somewhat similar to what a prism does if you cast light from a white light source on it: it decomposes white light into a spectrum of light at different wavelengths (frequencies, or colours), which can be recombined later to form white light again. In our case of sound waves, these partial waves can now be altered by changing their amplitude, frequency, harmonic relationship and harmonic evolution over time. Then, they are added together again to produce the output sound. It is clear that by decomposing the sound into its basic building blocks a much deeper understanding, and therefore, a more powerful manipulation of it is possible than by just applying a filter to a given bunch of samples.

Why has noone else built a software resynthesizer yet?

So far, resynthesis is a very computationally challenging task. Tens of thousands of partial waves have to be derived, updated and recombined in each second of a sound to reproduce the input signal at high quality. Not only is this a difficult and tricky process to do in software, it also eats up processing power very quickly. Therefore, in the past resynthesis-based synthesizers have required specialized hardware to do their processing, and even with the tremendous increase in processing power of desktop computer systems over the last few years a truly useful and playable polyphonic resynthesizer is difficult to do in software.

Prosoniq has developed a novel approach to this problem by introducing a new concept called MULTIKERNEL SPECTRUM RESYNTHESIS (MSR). MSR is different from the traditional resynthesis by not actually using the common sinusoid waves for its partial frequencies, but instead using more complex waveforms which are called "wavelets". Wavelets have emerged from the analysis of earthquakes in the 1990s and have quickly become a widespread mathematical tool for signal analysis and signal compression. They combine the advantage of a "spectral" representation of waveforms with low computational complexity and good time resolution. Prosoniq's MSR is the first Wavelet based synthesis technology used in a software synthesizer. This novel technology makes it possible to build a resynthesizer in software that can have as much as 40 voices polyphony on a 400 MHz G4-equipped computer.

Installing Magenta

Installing Magenta on your computer is very easy. Insert the CD ROM that came with the Magenta packaging into any available CD drive connected to your computer.

Open the CD by double-clicking the CD Icon.

Double click the "Installer" application that you will see on the CD. The Prosoniq software installer will come up.

About Prosoniq products and copy protection

We at Prosoniq have decided to equip our products with a minimum of copy protection measures. This means that there is no hardware dongle or key diskette copy protection used, and you do no longer require a machine-unique response code to run this software on your computer. We have decided to go this route because we do not want to annoy legal owners of our software with compatibility problems or authorization hassle, and with broken key disks or dongles. We have used key diskettes and a machine-unique response code system for a while, but we've had so many complaints from our users about expired software and the complicated way of authorizing it that we have decided to drop all these copy protection schemes once and for all. All you have to do to use the software is enter your name and the serial number that you will find on the CD label of the CD that contains this product.

However, it is crucial that you understand that only software that was purchased from us legally will allow us to continue developing new and exciting products in the future. Each and every copy of our software that is given away for free, or illegaly, will make it difficult and ultimately impossible to pay the people who make our products, and you might no longer see new products or updates for the product you have. Developing software for the audio industry, especially software that contains new technology and is as highly optimized as this product is, is costly. Only very few software developers can make audio software, because they require to be specialists in Digital Signal Processing to create this type of product. Making the packaging and the CD you are seeing in front of you is cheap, but developing software is expensive. Please support our development and distribution team by not sharing your copy of this product with others, and by buying our software and updates in your local music store or on our web site.

Thank you!

Choose the "Setup Authorization" option. Enter the serial number along with your name when prompted.

Next, choose "Install" to install the product on your computer. Make sure you install it in the "VST Plugins" folder where your software expects VST Plugins.

Setting up Magenta in your recording software

Magenta is designed to be used as a Master or track insert effect. It should not be used as regular track bus effect, as it might produce unexpected results if it is used as such.

Magenta is not a VST instrument. Therefore, you will not see it in the VST instrument rack. The problem with VST instruments is that they do not get an input signal from the VST audio tracks, and therefore you would not be able to use Magenta at all.

! Please note: if you are using this plug in with Cubase VST you can open the default song from the CD ROM which has all settings set up for you in order to start working with Magenta rightaway.

To use Magenta, first select an audio track in your VST main window. Open up the VST insert effects rack for that track by selecting "Insert" in the console window or open the VST master effects rack and select "• Magenta" from the plug in selection pop up menu. Please refer to your VST user's manual if you do not know how to do this.

Make sure the audio track has a sound loaded as Magenta requires and input signal to operate. Set up VST to loop this audio track in order to provide a constant input signal to Magenta.

Create an empty MIDI track to supply MIDI messages to the plug in. Select the MIDI track and choose "• Magenta" from the "output" menu to the left of the track display.

Start playback of the audio track and make sure the MIDI track is selected when playing Magenta, as you will not be able to hear anything if the plug in does not get any MIDI data. If everything is set up correctly you can now try the Magenta effects presets.

Routing a MIDI track to Magenta under Logic

Following is a short explanation of how to send the output of a MIDI track under Logic to Magenta.

IMPORTANT: You need OMS 2.3.8 to be installed for this configuration to work.

1) In the "Options" menu (from the main menu bar), select "Settings…" -> "MIDI Interface Communication"
2) In that prefs window, activate the "Use OMS if available" checkbox.
3) Select "Open Environment" window from the "Windows" menu.
4) In the environment window, select "All Objects" from the popup menu near the left margin of the window.
5) Still in the environment window, select "Update OMS Equivalents" from the "Options" menu.
6) Create a track in the Arrange window. This track will be the control track for Magenta.
7) In the track settings of that track (left side of the arrange window), click and hold to the right of the "Port" field until a popup menu appears, then select "IAC Bus" from that popup menu.

Now the track sends its midi data to OMS, which in turn sends it to Magenta. Please note that in the current (minimal) implementation of OMS in Magenta 1.0, the Plugin does not appear at all as an object or port in the OMS setup window, but it just receives everything that is sent out by OMS. These limitations as well as the need to use OMS will most probably be eliminated under Logic 5.

The Magenta effects parameters

Magenta offers you a wide range of parameters that allow a flexible control of the effect produced. Step through the presets that are provided with the software in order to see how flexible it is.

The LFO section

The LFO (Low Frequency Oscillator) section provides a LFO generator to create vibrato, tremolo or other modulation effects. You can select its waveform from a list of basic waveform types. Please make sure you have either set the LFO parameter in the Pitch section or Volume section set to a value > 0 as the LFO effect might otherwise not be audible.

RATE

Rate determines the speed of the LFO oscillation in oscillations per second (Hertz). Select a value according to your taste, a value between 10 and 20 usually gives best results for vibrato or to fatten up your sound.

DEPTH

Determines the overall depth of the modulation effect. Use this dial to reduce the LFO effect globally if you think everything sounds right but modulation is too strong.

DELAY

Determines the delay after which the LFO effect reaches its full depth. Larger values will take longer until it reaches its full depth, a value of 0 means no delay.

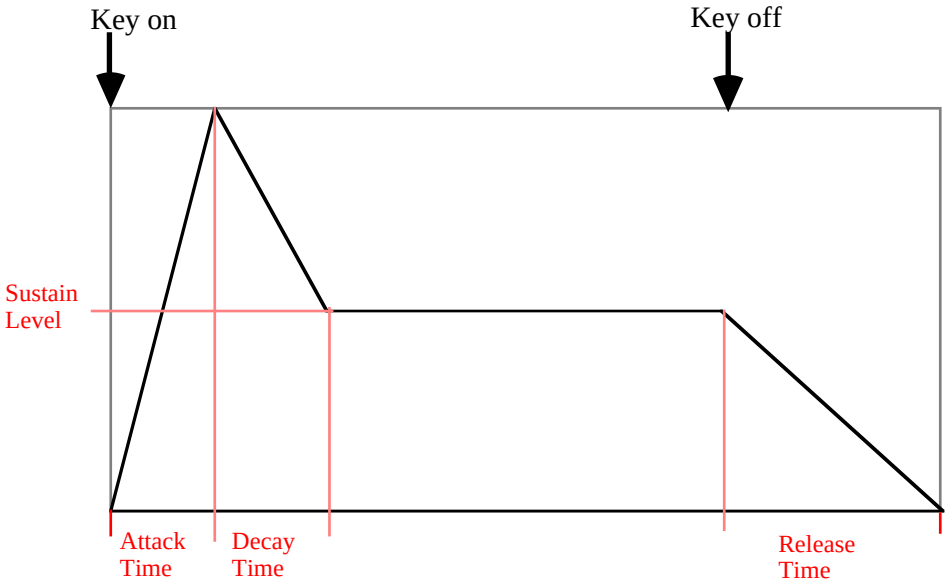
WAVEFORM

Defines the LFO waveform. Most common is SIN (sine wave), but you should try other options as well for cool effects.

SIN = sinewave
SQR = square wave
SAW = sawtooth waveform
RND = random sample & hold waveform

The Magenta Envelope section

The Envelope section lets you control all key parameters by an envelope. Envelopes define a change in sound over time and are typically divided into four phases: Attack, Decay, Sustain and Release. Hence, this type of envelope is called an "ADSR" envelope.



ATTACK

Defines the time it takes until the envelope reaches its peak level. Use larger values if you are modeling "bowed" instruments, as they typically have longer attack phases. If you are working with drums or other percussive instruments make sure you use a small value for attack.

DECAY

Decay defines the time it takes until the envelope reaches its stable "sustain" phase after the attack phase has completed. You should generally use smaller values if you are working with "plucked" instruments or percussion, as they typically have short decay phases.

SUSTAIN

Unlike Attack, Decay and Release, this parameter defines a signal level. It is the envelope's level that it produces while you are holding down the note on the keyboard. The envelope for that note will remain at this level as long as the key for that note is pressed.

RELEASE

This is the time that passes when you release the key until the envelope will reach zero. If you want the sound to continue playing after you have released the note, which is characteristic for string sounds, set this to a value > 0. If set to 0, the sound will stop immediately when you release the key on the keyboard.

The Settings control panel

The Settings control panel gives you access to the basic sound parameters and their modulators.

Pan

This panel sets the sound's panorama. Please note that the output of the resynthesis unit of Magenta is in mono to save processor power, but you can still pan the sound to produce a stereo image. A setting of 0 pans the sound to the stereo center.

LFO
Defines how the LFO influences the panning of the sound. If set to a value other than 0, the sound is panned to the left or right at a rate and waveform as defined in the LFO section (see above for a detailed explanation of the LFO section). If a negative value is used, the LFO panning is reversed.

ENV

Defines the influence of the envelope on the panning. Larger values will produce a more noticeable panning of the sound.

MIDI
Defines the MIDI controller type that influences the panning of the sound. You can choose from the following parameters:

Pbend	= Pitch Bend Wheel
Mwhl	= Modulation Wheel
Aftr	= Channel After Touch
Sustn	= Sustain pedal
Pedl	= Controller Pedal
Kybd	= Keyboard tracking, higher notes pan to the right, lower keys to the left

Pitch

This panel sets the sound's pitch in semitones.

LFO

Defines how the LFO influences the pitch of the sound. If set to a value other than 0, the sound is pitched up or down at a rate and waveform as defined in the LFO section (see above for a detailed explanation of the LFO section). If a negative value is used, the LFO pitch influence is reversed.

ENV

Defines the influence of the envelope on the pitch of the sound. Larger values will produce a more noticeable detuning of the sound.

MIDI

Defines the MIDI controller type that influences the pitch of the sound. You can choose from the following parameters:

Pbend = Pitch Bend Wheel
Mwhl = Modulation Wheel
Aftr = Channel After Touch
Sustn = Sustain pedal
Pedl = Controller Pedal
Kybd = Keyboard tracking, higher notes have a positive detune

QUANTIZING THE PITCH

The second pop up menu in the Pitch section defines how the pitch of the incoming signal is quantized:

Free = The pitch is not quantized
Qntz = The pitch is quantized to the neares semitone
Lock = The pitch is locked to a single note

If you set this option to FREE, the input pitch will be used for the output signal, and no changes to the input pitch are being made. This is the default option when working with monophonic and especially polyphonic signals that do not have a clearly defined pitch.

If you choose QNTZ (Quantize), the pitch will be locked to match the nearest semitone, provided that a pitch can be reliably detected. This is a very useful feature when you use voice as input sound, or are singing live and want to produce vocal harmonies on the fly.

If you choose LOCK, the input pitch will be discarded and a fixed pitch will be used instead. This gives the sound a vocoder-like quality, and creates pitched sounds from any input signal.

Volume

This panel sets the sound's volume.

LFO

Defines how the LFO influences the volume of the sound. If set to a value other than 0, the sound is made louder or softer at a rate and waveform as defined in the LFO section (see above for a detailed explanation of the LFO section).

ENV

Defines the influence of the envelope on the volume of the sound. Larger values will produce a more noticeable variation in volume of the sound.

MIDI

Defines the MIDI controller type that influences the volume of the sound. You can choose from the following parameters:

Pbend = Pitch Bend Wheel
Mwhl = Modulation Wheel
Aftr = Channel After Touch
Sustn = Sustain pedal
Pedl = Controller Pedal
Kybd = Keyboard tracking, higher notes increase volume

DIST
Sets the amount of distortion added to the input sound. This can produce interesting effects when you use the Magenta filter section.

The Globals control panel

The Globals control panel gives you access to the basic parameters used for playback and resynthesis.

TUNE

Sets the basic tuning of the plug in. Use this to match the tuning of the Magenta output to your song.

#VOICES

Sets the number of voices used for playback. On a standard G4 Macintosh you will be able to play at least 20 voices at the same time. If you experience CPU overs or simply do not want Magenta to use more than a specified limit of CPU cycles, reduce this value until operation goes smoothly and without drop-outs. If you wish to use the Plugin as monophonic sound source, set #Voices to 1. This will guarantee that only one voice will be playing at any given time.

FATTEN

The Fatten option creates a slight detune effect during resynthesis, giving the sound a „warm" and soft character. This is much like a very subtle chorusing effect and works great on voice and other lead instruments.

REVERB

REVERB SIZE

Determines the size of the reverb effect that is added to the output of Magenta. Larger values simulate a larger room size, smaller values simulate closeup situations and narrow sound spaces

REVERB AMT

Defines how much reverb effect is added to the output. Smaller values add less reverb, larger values add more. A value of 99 lets only the reverb signal thorugh.

SPREAD

Spread defines a delay between the left and right output channel. Although Magenta produces a mono output, this option allows for a pseudo-stereo image which is great for sustained sounds, or to create atmospheres. Larger values for Spread increase the stereo width, smaller values produce mono output. A value of 0 applies no effect.

The Dynamic Filter section

Magenta supports a maximum of 12 "spectral" filters that can be used to dynamically control and alter the development of the analyzed and synthesized sound. These filters affect each note separately which allows for a note-relative control of the effect. That is, if you fine-tune the filter to match a particular sample, the effect will transpose accordingly as you play the sound at different notes.
With the controls below and beneath the circular filter pad, you can influence the filters X and Y axis by a MIDI controller, the LFO, envelope, or all three of them.

At the time, the following filters are supported in Magenta:

NONE

None turns the filter unit off. This is the default setting and can be used if you want to tweak other Magenta parameters without hearing the filtered result.

CUTOFF+RESONANCE

Cutoff and Resonance control the damping and the resonance of a sound.

This is done using a very steep filter realized entirely in the digital domain It has a slope of at least 96dB/Octave, corresponding to a 16-Pole filter. Conventional resonant filters usually have between 1-4 Poles.

This filter does only alter the loudness of the partial frequencies in the sound, the harmonic relationship is not changed.

DAMPING+METALLICITY

This combines a low pass filter with a filter that detunes all partials in a sound by a random amount. This is good for creating chime-like sounds and weird vocal effects, make sure you use the Cubase effects automation to record gradual changes, to transform a singer into a speaking metallic tube!

TRANSLATE+SPREAD

This filter only affects the harmonic relationships in a sound. It detunes the partials in two different ways along the X and Y axis. This filter sounds great on drum loops and entire mixes, it can be used to create a hollow noisy sound as well as weird detune efx. Try it on your favorite sounds to see what it does

REGULARIZE

Regularize boosts repeating patterns in the signal. It can be used to add a metallic quality to spoken voice, ideal for Jungle and Drum&Bass effects. It can also be used to "thin out" a sound to create fragile, harmonic atmospheres. The amount of the effect is controlled by the X-Position of the green thumb, the depth of the effect is controlled by the Y-Position.

MAGNETIZE

Magnetize mirrors a sound's spectrum around a center frequency. The center frequency is set by the Y-Position of the thumb, the amount of mirroring is selected by the X-Position. If you set the green thumb in the middle of the area, you will get a single tone at the center frequency, as all frequencies in a sound are mirrored onto the center frequency. Dragging the thumb to the left gradually inverses the spectrum, dragging it right gets you back to the original sound.

FORMANT

Formant enables and disables the formant mode of the filter. Leaving the formant mode on will reproduce the tonal qualities of the input sound, for example, if you transpose a voice it will not sound like a chipmunk as you go up, but rather its natural character will be preserved if possible. For some sounds this might sound strange, for example when used on flute or other wind instruments. In that case we recommend disablingthis option.

Contact us

As audio professionals, our highest interest is to listen to your needs. If there is something you would like us to know, or any improvement to a Prosoniq product you would like to see, do not hesitate to email us about it. To ensure a prompt reply, use the email addresses listed on our home page

http://www.prosoniq.com/

From there you can also subscribe to our MAILING LIST to discuss your experiences with other customers, ask questions and even get in touch with our software development team!

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