

# X-Impact Synthesizer



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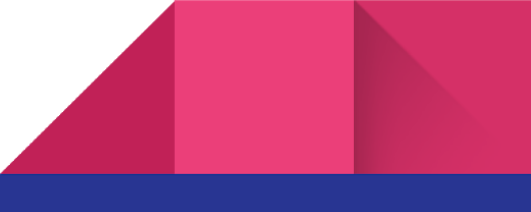
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## 1. Introduction

**X-Impact Synthesizer** – an instrument inspired by one of the most popular analog synthesizers of all times. Developed by the known trance producer Adrian Wójcik aka. A.R.D.I. from Poland. X-IMPACT is based on 3 oscillators to allow you to create interesting sounds at a global level in a fast and easy way. Available as Rack Extension format. X-Impact is a sonic playground that alludes to classic analog synthesizers - where synthesis is not only the end result, but also a journey of discovery and experimentation. Although X-Impact is capable of producing highly complex sounds and modulations, its design is easy enough that amateur music producers can easily discover and experience the joy and magic of X-Impact synthesis.

## 2. Sound Parameters

The front panel consists of several main parts for create and modulate sound :

- a) Controls
  - b) Oscillators,
  - c) Mixer,
  - d) Lfo,
  - e) Filter Env,
  - f) Amp Env,
  - g) Eq,
  - h) Filter,
  - i) Reverb,
  - j) Delay.
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- a) **Controls** : a group of potentiometers and buttons that allow you to adjust: Octave, Mode Poly, Glide, Velocity. You can also edit chorus effect for creating a thicker, fatter, wider sound. Depth of delay (pitch) modulation. Pre-delay for each voice. Number of chorus voices. Modulation rate.



*Pic 1. Controls*

- b) **Oscillators** - 3 oscillators with the same parameters offer 7 waveforms like : Triangle, Sharktooth, Ramp Up, Ramp Down, Square, Wide Pulse, Narrow Pulse. Semi - you can adjust the pitch of the oscillator in semitones, the range is 0-72 semitones (36 is basic tone). Fine - You can detune your sound and make it more interesting when you use 2 oscillators and use a "fine" knob. It allows for small adjustments within only a semitone (+/- 50 cents). Pitch - With this knob the initial key is respectively higher or lower (depending on how hard you set the pitch). The pitch always goes towards "0" - the key you really play.



*Pic 2. Oscillators*

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- c) **Mixer** - in this panel you can modulate the volume of the 3 oscillators analogously to the number: Volume 1 = Waveform 1. Volume 2 = Waveform 2. Volume 3 = Waveform 3. In addition, you can control the "SUB" or "Noise" volume. All oscillators are connected to the "drive" knob, if "drive" button is enabled. Turn the DRIVE knob to adjust the drive effect, which adds harmonics and distortion to the sound. The drive knob it's kind of saturation which can give you an interesting effect when you turn on 2-3 oscillators.



*Pic 3. Mixer*

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d) **LFO** - Low-frequency oscillation (LFO) is an electronic frequency which is usually below 20 Hz and creates a rhythmic pulse or sweep. This pulse or sweep is used to create audio effects such as vibrato, tremolo and phasing. X-Impact Synthesizer gives you a lot of ways to change lfo effect.

LFO Wave - Sine, Triangle, Square, Saw, Random (random steps), Drift (smooth random), Saw Up, Saw Exp (exponential decay). Rate - Duration of 1 cycle of the LFO waveform (0,01 Hz - 100 Hz). Sync - Set Rate units to Hz (cycles per second) or beats (quarternotes per cycle). Retrigger button - When Off, all voices will be modulated together in sync. When On, the LFO for each voice starts from the beginning when the note is triggered. Depth Lfo - intensity of signal.



Pic 4. LFO

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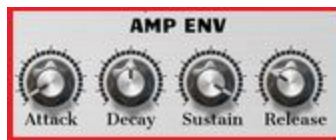
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e) **Filter Envelope** - Basically, an envelope determines how a signal behaves over time. The fundamental parameters of an envelope are Attack, Decay, Sustain and Release. Changing these parameters can radically alter the characteristics of a sound, and an understanding of how they work is essential to sound synthesis. However, even if you simply want to tweak preset sounds rather than creating them from scratch, it's good to know what's going on under the hood. The attack parameter determines how quickly the envelope is applied once it has been triggered. The decay parameter determines how long it takes the envelope to fall from its highest attack level to its default level. The sustain parameter is the only one of these envelope controls that is purely level-based rather than time-based. The sustain determines the level (or volume, in the case of an amplitude envelope) that the signal will stay at once the decay phase has passed. The signal will be maintained at this level for as long as the key is pressed. The release parameter is essentially the reverse of the attack parameter. It determines how long the signal takes to return to zero after the key has been...well, released.



*Pic 5. Filter Envelope*

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- f) **Amplifier Envelope** - You have 4 knobs for control Amp envelope. Using Attack - controls the attack time of the amplifier envelope. Decay - controls the decay time of the amplifier envelope. Sustain - controls the sustain level of the amplifier envelope. Release - controls the release time of the amplifier envelope.



*Pic 6. Filter Envelope*

- g) **EQ** - Simply Equalizer with three frequencies (Low, Mid, High).



*Pic 7. Equalizer*

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h) **Filter 1 & Filter 2** - This panel gives you opportunities to control 4 parameters (Filter 1) and 2 knobs for Filter 2. *Cutoff* - This knob is used to set the cutoff frequency. Harmonic content above the cutoff frequency will be filtered out. Turning the knob to the left will lower the cutoff frequency, and turning the knob to the right will raise the cutoff frequency. If the CUTOFF value is set too low, the volume may be extremely low. *Resonance* - Adds additional emphasis to the overtones occurring at the CUTOFF frequency, giving a distinctive character to the sound. Turning the knob to the right will increase the resonance effect. The overtones that are emphasized will change depending on the cutoff frequency. For this reason, it's good to adjust the CUTOFF knob while adjusting the RESONANCE knob. When emphasizing the overtones in this way, the sound may distort depending on the cutoff frequency or the input audio. *Filter Env* - Controls the amount of the filter envelope, which is added to the cutoff frequency. *Cutoff Mode* - 12 dB highpass, 6 dB bandpass, or 6 to 24 dB lowpass.



Pic 8. Filter 1 & Filter 2



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- i) **Reverb** - Reverb is created when soundwaves from any sound source reflect off surfaces in a room causing a large number of reflections to reach your ear so closely together that you can't interpret them as individual delays. The result is magnified in larger rooms where it appears that the sound continues after the source has stopped. The larger the room, the larger the potential reverb. This panel gives you a lot of options for creating high quality reverb effects. Mix between dry and wet signal (both unaffected at 50% mix). Pre-delay - Initial delay before reverb. Low - Highpass filter cutoff frequency. High - Lowpass filter cutoff frequency. Dry - Level of the unprocessed input signal sent to the output. Wet - Level of the effected signal. Time - Length of reverb tail. You can turn on/off this effect with the "reverb" button.



*Pic 9. Reverb*

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- j) **Delay** - Stereo delay effect with adjustable feedback routing and left/right spread. You can control with many knobs like :
- Ratio - Negative values reduce the left channel delay, positive values reduce the right channel delay.
  - Feedback - form delay output to input to create multiple repeats.
  - Sync - Sets Time parameter to seconds or quarternote beats.
  - Stereo - Delay Feedback Mode for Sets which channel(s) feedback is taken from.
  - Dry - Level of the unprocessed input signal sent to the output.
  - Wet - Level of the effected signal.
  - Time - Delay time. You can turn on/off this effect with the "delay" button.



*Pic 10. Delay*

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Other knobs not described in the above-mentioned panels are :

**Volume** - Master Volume Potentiometer [dB].

**Frequency Shifter** - Bode frequency shift (inharmonic shift in Hertz, not pitch) applied individually to each voice.

**Width** - Adjust stereo width (100% is natural signal. 150% is max value).

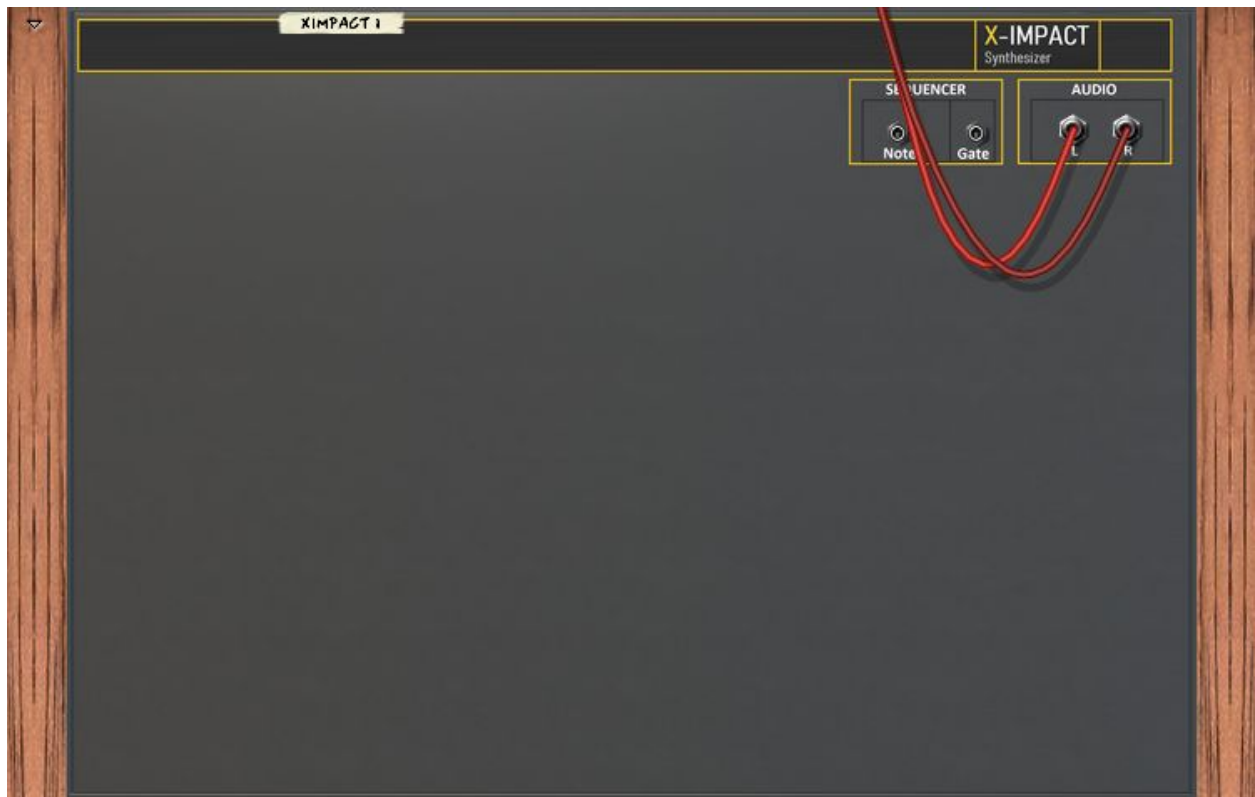
**Distortion** - form of audio signal processing used to alter the sound of amplified electric musical instruments, usually by increasing their gain, producing a "fuzzy", "growling", or "gritty" tone. Don't forget to click "Distortion" button !



Pic 11. View of Panel with other knobs

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**Back Panel** gives you basic options for connect X-Impact Rack Extension to sequencers like Matrix,RPG-8 or Thor. You have Note/Gate CV Inputs. Audio Section with L/R connects X-Impact as stereo Rack Extension. If you want use it as Monophonic instrument use the left (L) connector.



*Pic 12. View of Back Panel*

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