xLPG

Vari Pass Gate

[RACK EXTENSION]

MANUAL

2020

FX device by Turn2on Software

LPG – is a Low pass gate effect, which can be used to produce various tuned percussion sounds such as a congas, bongos, steel drums, marimba, plucks, etc. LPG processes the original signal using the control trigger signal (which opens the gate). This is a legendary effect known in the modular world as the "Buchla Bongo" sound effect and was a very popular sound-design tool used by the pioneers of electronic music. The effect continues to be used today by modern electronic musicians using Eurorack/Buchla modules. LPG also enables the creation of natural-sounding decays.

xLPG is not just a simple LowPass Gate, it is a VariPass Gate effect which can be used as a Multimode Gate with various filter modes (LowPass Gate, BandPass Gate, HighPass Gate, State-Variable Gate and also Comb Gate effect). This provides an impressive selection of alternatives to classic LPG.

Vactrols (optocouplers) lie at the heart of the LPG and help to create natural sounding decay. xLPG includes 9 internal types of Vactrols, each with their own individual characters.

xLPG can be used as both a simple VCA (amplifier) or as a multimode filter (VCF). Its main use however is as a very unique Vactrol based VariPass effect with 9 custom Vactrol modes.

The envelope section includes additional controls for adjusting Attack, Hold and Release parameters. These can be used to further increase flexibility in forming the processed signal.

This however is not all, the device includes four Gate modes:

- **VPG (VariPass Gate)**. When the OFFSET knob is set to 0% the gate is fully open. When set to 100% the gate is fully closed. In this mode, as the OFFSET knob is dialed from 0-100%, the filter opens and at the same time the VCA increases the Vactrol processed signal to 0dB.
- **MDF (Mid Feedback Gate).** This mode works in the same way as the VPG mode, but adds decay feedback when the OFFSET knob is set near to 50%.
- **FOG (Full Open Gate).** In this mode the device works in an inverse fashion to VPG mode. When the OFFSET knob is set to 0% the gate is fully closed. When set to 100% the gate is fully open. Dialing the OFFSET knob from 0-100% results in a linear increase of the main signal coupled with a corresponding reduction of the Vactrol-processed signal.
- **VPGQ (VariPass EQ)**. This mode adds only EQ charatcers of the Vactrols (not creating decay).

xLPG is a modern effect processor which can be used to create natural sounding rhythmic percussive sounds. Experimenting is highly encouraged.

LPG processes signals only when it recieves an active control signal. This can be done in three ways: Using CV Trigger input (like a real modular), by Sidechain audio input or by the TRIGGER button. The main parameter of the device is the OFFSET knob which controls the Filter, VCA or LPG level. When in BOTH mode both filter and VCA operate at the same time. This is what is usually referred to as a LowPass Gate.

xLPG, however, is more than just a simple LowPass Gate. It is a Varimode Gate effect which includes 9 vactrol models.

This Modern Vari Pass Gate effect is unique and will be a magical and powerful addition to your Reason Rack.

LPG / THEORY

West Coast Synthesis

The LPG effect is inspired by the original Buchla 200 Series Low Pass Gate module created in the 1970s by synth pioneer Don Buchla (West Coast synthesis).

LPG is a Low Pass Gate which combines a low pass filter (VCF) with an Amplifier (VCA), to create VCFA. LPG aims to mimic the natural sound of organic decay of incoming and control signals passing the Vactrol.

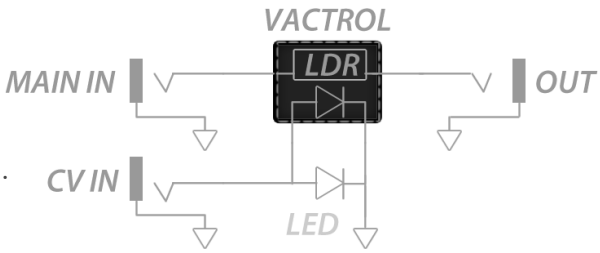
LED LDR

OPTOCOUPLER

VACTROL

A Vactrol is a resisitive opto-isolator, or photoresistive opto-isolator. The simplest form of Vactrol is an analogue optoisolator (Optocoupler). Optocouplers are comprised of a light dependent sensor (LDR) and a light source (LED), housed within a light-isolated casing. Increasing the LED brightness causes a decrease in the LDR resistance.

Vactrols / Optocouplers can be replaced by OTA, transistors, FETs or diodes, however all of these can result in distortion of the signal. Vactrols / Optocouplers do not add distortion and this is the main reason why the sound of vactrol based devices is referred to as "soft".



It should be noted that no two Vactrols will sound exactly the same due to variations in distancing between the LED and LDR, different LED brightness etc

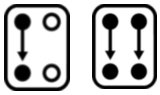
LPGs are very well known as Eurorack modules and are a combination of VCA and Lowpass filtering that come from using Vactrols, isolated from light pair of LDR and LED (photo resistive opto-isolators or optocouplers). LowPass Gate is able to create Bongo-styled percussion sounds by using the main incoming signal and second control signal which are then passed through a Vactrol. It is the Vactrol which creates the "buchla-bongo" natural decay sound effect.

LPG can set the level of the control signal. The control signal simulates the brighness intensity of the LED. The light emitted by the LED is in turn received by the LDR where it is converted into natural sounding decay.

HOW TO WORK WITH xLPG:

1. Create an instrument with one long note or sequence.
2. Add the xLPG effect to this instrument (using Main Inputs)
3. Select trigger source [CV Input / Sidechain Input / Manual Trigger button]
4. Produce Trigger signal [using CV Trigger input / Trigger button or Sidechain input]
5. The signal is then processed adding Vactrol-based natural sounding decay
6. The Envelope controls (AHR), you can set needed flexible forms

CONNECTIONS:



The device is a True-Stereo effect. For Mono input, the device produces mono output. For Stereo input, the device sums the Left and Right channels before applying the effect. The output is in Stereo.

FRONT PANEL

Modern look of the classical Lowpass Gate fx

MODES:

MODE SECTION

BOTH

The default setting for xLPG. This setting engages both the VCA (amplifier) and VCF (filter) modes at the same time. The **VCA** controls the **main signal** level. The **control signal** can be generated by CV Trigger input, Sidechain audio input, or by the Trigger button. The filter works by default in LowPass 12dB mode (emulating LPG). Other filter types are also selectable. These can create variative functionality of xLPG as a Vari Pass Gate effect.

FILTER

In this mode the VCA (amplifier) is disabled and the device functions as a Multi-mode Filter

VCA

In this mode the device functions as a traditional amplifier with a range from silence (infinity) to 0dB. The control signal (CV Trigger input, Sidechain input or Trigger button) sets the main signal level affected by the Vactrol decay and Envelope curve

OFFSET CONTROL

MODE	OFFSET	RESONANCE
BOTH	Main VariPass Gate mode (LPG by default). Controls the filter Cutoff and amplifier level at the same time	Resonance filter control
FILTER	Controls the filter Cutoff	Resonance filter control
VCA	Controls the Amp level [-inf.. 0 dB] proccessed signal by the Vactrol decay and the Envelope curve.	[x]

ENVELOPE CONTROL

The envelope section includes additional controls for adjusting Attack, Hold and Release parameters. These can be used to further increase flexibility in forming the processed signal

MODE	OFFSET
ATTACK	Time needed for the gate to open
HOLD	Minimum time the gate will stay opened
RELEASE	Time needed for the gate to close

VACTROLS

A **Vactrol** is a resisitive opto-isolator, or photoresistive opto-isolator.
The simplest form of Vactrol is an analogue optoisolator (**Optocoupler**).
Optocouplers are made up of a light dependent sensor (LDR) and a light source (LED), housed within a light-isolated casing. Increasing the LED brightness causes a decrease in the LDR resistance.
No two Vactrols will sound exactly the same due to variations in distancing between the LED and LDR, different LED brightness etc. xPLG includes 9 types of custom vacrols / optocouplers

VACTROL MODELS

VACTROL	CHARACTER
VCL-1	Main default vactrol with neutral character
VCL-2	Mid High character
VCL-3	Low High character
VCL-4	High character
VCL-5	Mid character
VCL-6	Low character
VCL-7	Max Low character
VCL-8	Mid Low character
VCL-9	High Low character

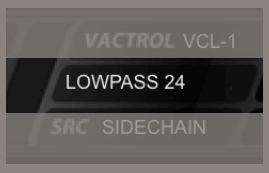
Vactrols / Optocouplers work in the following 3 modes: VariPass Gate, Filter and VCA.

In Filter Mode the Vactrol emulates a Vactrol-based VCF
In VCA mode the Vactrol emulates a vactrol-based VCA.

Selection of the vactrols VCL 2 ... VCL9 activate Vactrol Level knob (-inf.. +12 dB gain)

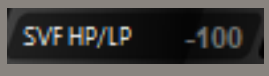
FILTER

MULTIMODE FILTER SECTION



When the device is running in either BOTH or FILTER modes the incoming sound is affected by the filter. In VCA mode the filter is disabled.
The filter is set by default to LowPass 12dB/oct, which emulates an LPG.
xLPG offers 9 internal filter types which add new possibilities for creating not only LowPass Gate effects, but also modes such as BandPass Gate, Comb Gate, etc.

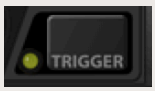
FILTER TYPES	FILTER INFO	FILT GATE MODE
LP 12	2-pole Low Pass filter (12 dB/oct)	Low Pass Gate
LP 24	4-pole Low Pass filter (24 dB/oct)	Low Pass Gate
BP 6	1-pole Band Pass filter (6 dB/oct)	Band Pass Gate
HP 12	2-pole High Pass filter (12 dB/oct)	High Pass Gate
COMB POS	Comb filter	Comb Gate
COMB NEG	Comb filter with inverted phase	Combe Neg Gate
SVF	2-pole state-variable filter (12 dB/oct)	SVF Gate



State-Variable filter has an additional parameter: High/Low Pass frequency attenuation (-100/+100)

CONTROL SIGNAL SOURCE

Control signals work in pairs with the main signal going through the Vactrol which creates the natural sounding decay. xLPG can recieve Control signals from any one of the following:

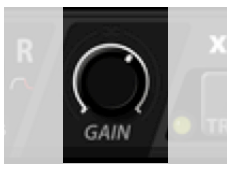
SOURCE	INFO
SIDECHAIN INPUT and CV TRIGGER 	The CV TRIGGER Input can be used to initialise the control signal. The Sidechain audio inputs can also convert incoming audio signal to the control signal. Sidechain inputs and CV Trigger input can be found on the rear panel of the device. Beside the Sidechain Inputs is a Sidechain Intensity knob (this is used to control the level of the sidechain input).
TRIGGER BUTTON and CV TRIGGER 	The CV TRIGGER Input can be used to initialise the control signal. Using this mode disables the Sidechain Input. The TRIGGER button can also be used to initialise the control signal.
DISABLED	This disables the control signal at all inputs (Sidechain Input, Trigger button and CV Trigger input) and preserves only the main signal. The VCA mode controls the level of the main signal. The Filter mode operates as normal. In BOTH mode the selected filter operates in combination with the VCA. That is to say, they work together as a Vactrol-based filter with VCA level control (without the need for control signal triggering)

GATE MODE

GATE MODE select the principal scheme of the Gate opening

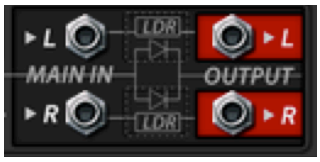
SOURCE	INFO
VPG (Vari Pass Gate)	Default mode. When the OFFSET knob is set to 0% the gate is fully open. When set to 100% the gate is fully closed. In this mode, as the OFFSET knob is dialed from 0-100%, the filter opens and at the same time the VCA increases the Vactrol processed signal to 0dB. The trigger works regardless of whether the gate is open or closed
MFD (Mid Feedback)	This mode works in the same way as the VPG mode, but adds decay feedback when the OFFSET knob is set near to 50%.
FOG (Full open gate)	In this mode the device works in an inverse fashion to VPG mode. When the OFFSET knob is set to 0% the gate is fully closed. When set to 100% the gate is fully open. In this mode, dialing the OFFSET knob from 0-100% results in a linear increase of the main signal coupled with a corresponding reduction of the Vactrol-processed signal.
VPGQ (Vari Pass EQ)	This mode adds only equalisation characteristics of the Vactrols (and not creating decay).

OTHER



PARAMETER	INFO
Bypass / On /Off	Standard switch with 3 modes: Bypass effect, On Effect, Off Effect
SOFT BYPASS	Bypass with fading of effect activity (without glitches)
GAIN	Control output Gain level of the xLPG effect (-inf...+12 dB)

REAR SIDE PANEL



AUDIO INPUT / OUTPUT
Mono/Stereo connections for Input and Output audio signals

SIDECHAIN INPUT
Audio input of the control signal with Intesity level control knob

CV TRIGGER INPUT
CV input of the control signal

VACTROL INSERT
Visualisation of the selected vactrol / optocoupler model

CV INPUTS
Use these CV inputs to control the main parameters of the device

xLPG

Vari Pass Gate FX

Available in the Reason Shop

Re Rack Extension

Turn2on

Rack Extension Developer

contacts: https://turn2on.com/
supp.turn2on@gmail.com

Thanks to all beta-testers. Special thanks for help to:
- MrFigg
- Philip Meadows (Despondo)