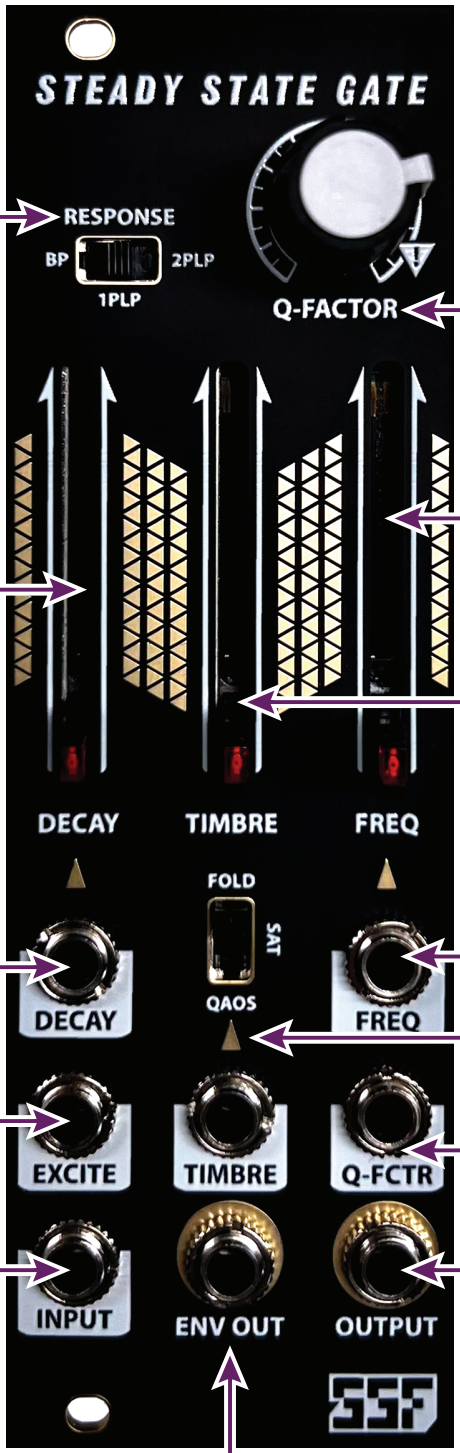
STEADY STATE GATE



RESPONSE
Selects the filter
Topology of the VCF
1-POLE Band-pass or Low-pass
Or 2-POLE Low-pass

Q-FACTOR
Controls the Resonance
Level of the VCF

FREQ
Controls the Frequency
Offset (Cutoff) of the VCF

DECAY
Controls the Decay
Profile of the LPG and
Envelope output

TIMBRE
Controls the Level of the Selected
Timbre Mode Effect

DECAY CV INPUT

FREQ CV INPUT

TIMBRE Mode Selection and CV INPUT

EXCITE
Conditioned and Level Sensitive
Gate/Trigger Input to 'Pluck' the SSG

Q-FACTOR CV INPUT

SIGNAL INPUT

SIGNAL OUTPUT

ENVELOPE OUTPUT

SYNOPSIS

The Steady State Gate is a discrete Low Pass Gate with a level dependent EXCITE input. This input combined with variable DECAY and FREQUENCY depth controls with CV inputs offers a wide range of dynamic low pass gate sounds.

The capability of the Steady State gate in enhanced via the addition of a multi-mode TIMBRE section; including a Wave Folder, Soft Saturating Overdrive, and a unique resonance modifier called QAOS.

An Envelope output is provided for enhancing the sonic capabilities even further via self patching back into the Steady State Gate's CV inputs, or may be used to control external modules.

Please follow the explanations below to get a full understanding of how you can get the best out of your Steady State Gate.

Examples for achieving various Low pass gate responses and alternate effects will be discussed where applicable. Please experiment with all of the examples and suggestions to fully grasp the Steady State Gate's capabilities.

VCF OPERATION (stand alone)

The Steady State Gate will operate as a stand alone VCF when nothing is patched into the EXCITE input.
Select the type of filter RESPONSE using the switch on the top left of the module. You may select between a 6dB Band-pass (BP), 6dB Low-pass (1PLP), or 12dB Low-pass (2PLP) filter response. Use the FREQ slider and FREQ CV input to modify the cutoff frequency of the filter. Adjust the amount of resonance using the Q-FACTOR and CV input control up to self-oscillation.

> **LPG TIP :** ***An alternate LPG response can be attained by setting the FREQ control all the way down, and applying an external envelope with fast attack and exponential decay into the FREQ CV input. This optional method of achieving a LPG sound has a softer attack and mimics the response of some traditional Low Pass Gates with a less percussive sound. The dynamics and ringing will depend on the shaping of the external envelope used for CV control.***

TIMBRE may be used to further affect the input signal and resonance behavior. Please see the TIMBRE section for more details about the TIMBRE modes and control.

LOW PASS GATE (VCF/VCA COMBO) OPERATION

The Steady State Gate utilizes a specialized envelope generator to model a variety of Low Pass Gates. This envelope is further processed for controlling the internal VCA and VCF to achieve a generally percussive and plucky sound combined with the iconic decay (ringing) of traditional LPGs. The dynamics of this effect are heavily dependent on the relative position of the DECAY and FREQ controls, and the selected Filter RESPONSE.

The EXCITE input is used to pluck the VCF and VCA. This input is intended to be used with triggers or gates for excitation. This is a level sensitive input that is also sensitive to the length of the applied trigger or gate up to roughly 50mS. Short triggers exhibit a slightly softer percussive effect vs. using a gate for excitation. EXCITE sources in the range of 8-10V typically exhibit similar percussive dynamics. However, the depth of percussive attack and overall gain can be dynamically controlled via sources falling below around 6V - down to 0V, where the output will become fully attenuated.

> **LPG TIP :** ***Use an attenuator to vary the level of the signal you are using to EXCITE the Steady State Gate for varied dynamics. Try patching your EXCITE source into an external VCA before patching into EXCITE. Now modulate that VCA to achieve a wide range of signal dynamics and accents.***

An envelope may also be used to EXCITE this input with some sensitivity to the envelope's attack time - up to around 50mS before the signal becomes fully attenuated. Changing the attack time and shape will affect the initial transient of the LPG sound and may be further affected by adjusting the amplitude level of the envelope.

It should be noted that just about any type of signal can be patched into EXCITE for alternate effects. This could be an LFO or audio rate VCO, or percussive element (for a dirtier sound.) Try using a low frequency pinged filter or kick as your EXCITE input for a trailing trill effect. Mix this with your basic trigger source before patching into EXCITE for more variety.

LOW PASS GATE (VCF/VCA COMBO) OPERATION *continued...*

Select the Filter type using the RESPONSE switch at the top left of the module. 1PLP is the 6dB Low-pass (1-pole) mode and is the standard for most LPGs, offering a brighter ringing effect. 2PLP is the 12dB Low-pass mode (2-Pole) and will provide a steeper filter response with a darker ringing effect. Both of these modes are heavily dependent on the relative positions of the DECAY and FREQ slider controls. Try different combinations of these controls and filter responses. A non-traditional BP (1-Pole Band-pass) mode may also be selected as an alternate filter response.

> **LPG TIP :** ***The scope of DECAY and FREQ slider positions can vary between being extremely short and percussive to a more traditional yet still 'Plucky' LPG response. Some settings can reduce the sound to simple clicks all the way up to being nearly totally open. I suggest you start with the FREQ control all the way up and DECAY time all the way down. As you turn up decay, you will notice the ringing effect get more extreme and very open past the mid-point. With decay at the mid-point, now start turning the FREQ control down and notice how this affects the brightness and ringing effect. You will now notice how the ringing is reduced and overall sound becoming muted as you turn FREQ down below the mid-point.***

The general range of DECAY and FREQ slider positions during combo operation involves the entire breadth of the decay control in combination with the FREQ control set from just below the mid-point and up to achieve plucked LPG effects. DECAY will typically need to be set higher as the FREQ control is set progressively below the mid-point of the slider. This results in a nice muted pluck with increased ringing. Experimentation with DECAY and FREQ slider positions and filter frequency RESPONSE modes is strongly encouraged.

Q-FACTOR controls the resonance level of the VCF. While most LPGs are nearly non-resonant, Q-FACTOR allows a variable amount of resonance to be applied to the sound of the filter. This can result in more pronounced click attack transients and can add an additional oompf to the sound or create a classic resonant filtering effect. These effects are largely dependent on the positions of the DECAY and FREQ controls. Self-oscillation begins when Q-FACTOR is set to just above the sine wave icon on the control. The amplitude of self-oscillation is increased past this point into the region of the warning icon and beyond.

> **KICK TIP :** ***The Steady State Gate can make a great kick! No signal input needed. Patch an appropriate signal into the EXCITE input. Set Q-FACTOR to above the sine wave icon (increasing Q-FACTOR will emphasize the kick.) Use the FREQ slider to set the pitch of the kick - just above mid-point is a good starting position. Set the DECAY slider to change the FM and tail of the kick (just below to above mid-point are good starting positions.) You can alter the initial transient click of the kick by changing the voltage level of the trigger source going into the EXCITE input.***

> **PATCH SUGGESTION :** ***While on the subject of kicks, the Steady State gate is also great for shaping and adding dynamics to external percussion modules. Try processing single drum sounds or full drum mixes into the signal input. You can trigger the EXCITE input with a tempo related trigger sequence to enhance the frequency and amplitude dynamics of your drum mix.***

You can take advantage of the ENV output for self patching a different LPG response with a bit more breadth and openness. The ENV can be patched back into Q-FACTOR, FREQ, or TIMBRE for instance. Or you can patch the ENV to control external modules in your patch.

> **LPG TIP :** ***Patch the ENV out back into the FREQ CV input. This will increase the effect on the VCF quite a bit, allowing the LPG to remain open a bit longer. This response is more similar to the faster classic LPG responses - like some variants of the Buchla 292. This patch will alter the range of the FREQ control and you will notice that the entire range of the FREQ slider will be of necessary utility. Experiment with DECAY and FREQ slider position combinations.***

****You may also opt for an attack/decay/release type of gated response by patching a gate signal of desired length into both the EXCITE and FREQ CV inputs. Patching the GATE signal into an attenuator first will prove useful for a greater range of response. Adjust DECAY and FREQ to taste. The effect results in a fast attack and a decay time dependent on the DECAY slider position while the GATE is high. The signal will trail off in a release fashion when the GATE goes low. Try the different filter types and adding some resonance.**

TIMBRE

The Steady State Gate features three voltage controlled TIMBRE circuits. Select the TIMBRE type using the switch below the TIMBRE slider. Use the Slider and CV input to vary the selected TIMBRE effect. All modes exhibit a ducking effect when an applied CV input signal is sufficiently negative in relation to the slider position. More on the benefits of this behavior will be described below.

TIMBRE TYPES:

FOLD Wave Folding mode for adding additional harmonics to the input signal, before hitting the Filter. Adding a DC offset to the input signal will alter the behavior of the wave-folder's symmetry and therefore, the harmonic content of the processed signal. Works best with Sine, Triangle and Saw waves.

SAT Soft-Clipping Overdrive for pushing overall amplitude, emphasizing bass and saturating the high frequencies of the input signal, before hitting the Filter.
Adding a DC offset to the input signal will alter the Saturation symmetry and alternately emphasizes the odd and even harmonic content of the input signal. Works best with Sine, Triangle and Saw waves but will also add gain to Square waves.

QAOS Unique resonance modifier that changes the character and behavior of the Q-FACTOR circuitry.
Low Q-FACTOR produces a subtle effect in QAOS mode. Turn up Q-FACTOR for an enhanced effect.
TIMBRE slider position will alter the effects dramatically in a non-linear fashion, hence the 'chaos in the Q'.
Adding a DC offset to the input signal will affect both the input signal's symmetry and position of the resonant peaks on most waveforms. Works well with all waveform types.

Given the DC offset response to the different TIMBRE types, we should note the additional scope of modulation that can be taken advantage of by mixing your input signal with an LFO, Envelope or VCO before patching into the Steady State Gate for creating a layer of harmonic variability.

The ENV may also be patched back into the TIMBRE CV input to impart the dynamics of the LPG onto the TIMBRE control.

All TIMBRE circuits exhibit the ability to DUCK the input signal or affects a particular TIMBRE type (QAOS). When using FOLD or SAT types, a sufficiently negative control voltage will attenuate the input signal. The extent of this effect depends on the TIMBRE slider position and the level of negative voltage applied to the TIMBRE CV input. Subtle or extreme tremolo effects can be achieved using an LFO as a control voltage. A negative envelope will simply duck the signal from whatever position the TIMBRE slider is set to, allowing for side-chaining the Steady State Gate. Audio rate signals from a VCO will produce pseudo ring-modulation sounds. You can strike a balance between the selected TIMBRE type's effect and the amount of ducking by treating the slider as an offset to the incoming negative CV. An external CV attenuator may prove useful for achieving a wider range of results.

The effects of ducking in QAOS mode are more nuanced and dependent on the shape of the negative CV applied. The ducking effect in this case simply reduces the QOAS down to no interaction with the Q-FACTOR circuitry. Negative CV does not affect the level of the input signal while in QAOS mode.

****As mentioned, QAOS can still have a subtle effect when Q-FACTOR is set at minimum. This can prove as an interesting method to achieve a more plucked string sound, especially in the bass register - think upright bass-like sounds. This works best with a lower frequency triangle wave, although sine waves work too. With Q-FACTOR down, set the TIMBRE slider up to around 70-75% of it's travel while in QAOS mode. Adjust the DECAY and FREQ controls to about 70-75% of their slider positions to start and fine tune from there. Try both Low-pass filter modes. Vary the pitch of your input signal with a sequence. *Does this sound like an upright bass to you? Some minimal form of analog modal synthesis?* Just keep in mind that the effect become less pronounced as you increase the frequency of your input. Works best with the bass.**

VCA OPERATION (stand alone)

The Steady State Gate will operate as a stand alone LPG in VCA mode with a high frequency roll off around 10kHz. The FREQ control provides enough offset to keep the Filter generally open when the slider is in the maximum position. Set the RESPONSE type to 1PLP or 2PLP for VCA mode to work correctly.

Patch an appropriate signal into the EXCITE input to trigger the VCA. Use the DECAY control to adjust the amount of ringing. Similar patches described in the COMBO mode section may be used to keep the VCA more open.

FORMANTS

The Steady State Gate can create some interesting formant effects when the right type of modulation is used to modulate the Filter. The formant effect is best realized when Q-FACTOR is set to just below the sine wave icon on the control. The input signal should remain in the low-mid range of the audio band. A separate VCO should then be patched into the FREQ CV input. This modulation VCO will need to be set to an appropriately high enough frequency above the input signal's frequency to start realizing formants. DECAY and FREQ sliders will need to also be set to positions that emphasize the formants. TIMBRE type and level will also affect the formant sound..

While the above patch can produce some basic formants, I recommend the patch below for achieving a wider and more aggressive range of formant sounds.

I like to use the Entity Ultra-Kick for this patch example. Instead of using a VCO as your input, use the Ultra-Kick or another kick drum or a pinged filter sweep. Use the same trigger source for your kick to EXCITE the Steady State Gate. The kick frequency will need to be in the mid range with a fair bit of a resonant bass tail for more drama in this patch. Pitch FM of the kick is also important - think in the range of a laser kick. Now apply your external VCO to modulate the FREQ CV input. To begin, set the DECAY slider to max and FREQ slider to about 70-75% and keep TIMBRE down for now in FOLD mode. You will need to raise the modulating VCO frequency sufficiently high enough until you start hearing formants like "YEEAAH" and "EYEEE". Make sure you have Q-FACTOR set to just below the sine icon and there may be a sweet spot in there for you. Start triggering your kick and the EXCITE input. Adjust the FREQ slider up and down to vary the formants. Now start turning up TIMBRE and repeat with the FREQ control. Try the same steps using SAT and QAOS mode. You can try changing the DECAY time but the effect is more dramatic when DECAY is set 50% to max. Patching the ENV out into TIMBRE CV may also prove useful. This patch is definitely worth playing around with if you like formants.

TECHNICAL INFORMATION

CONNECTING POWER

Connect the supplied power cable to the module by aligning the RED STRIPE with the Power Header side labeled RED on the PCB. You cannot break the module by applying power in reverse - the module just wont do anything if you do. Just unplug it and attach the power cable correctly if this happens. This module requires a minimum of +/-75mA for proper operation.

CV INPUTS RANGE

All CV inputs will accept a full +/-10V range without damage or adverse effects. All sliders behave as Positive Offsets respective to their CV inputs. External CV attenuation is recommended for greater control of all Voltage Controllable parameters.

Width: 8hp
Depth: 23mm
Power: +/-75mA