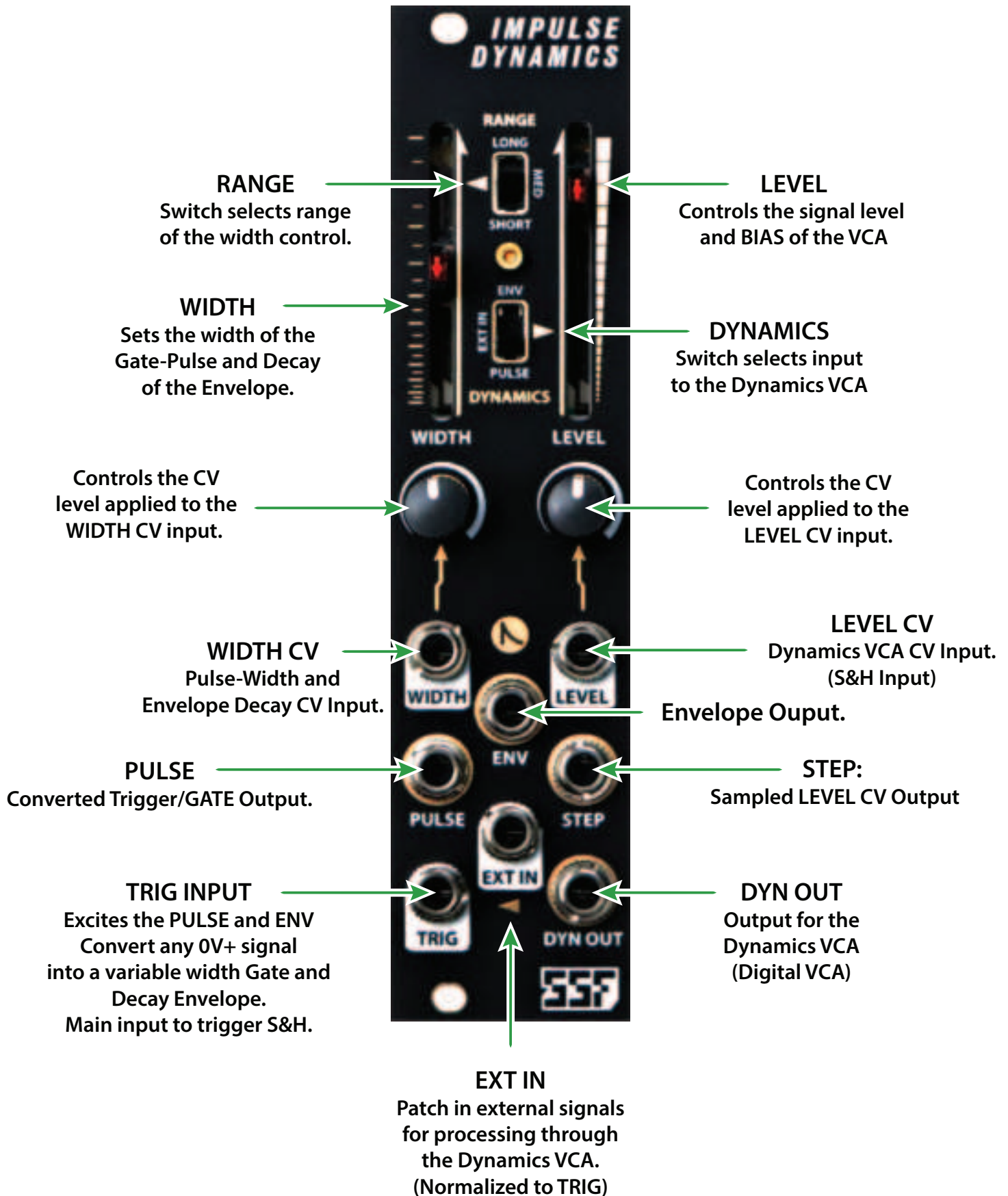


IMPULSE DYNAMICS



SYNOPSIS

Impulse Dynamics offers a simple way to produce discrete, dynamic transients within your modular system. The effect of the dynamic transient, or impulse, is synonymous to controlling the velocity within a DAW or keyboard synthesizer. However, achieving this utility within the modular ecosystem has not been streamlined into a single module, until now.

APPLICATIONS: Velocity control for LPGs, Drums, SLEWs, Envelopes, VCFs, VCAs. Pulse Width Modulation, Synchronizing CV and Audio and other Digital VCA duties.

This 6hp utility offers a few additional useful features including the ability to convert any positive transition into a positive trigger or gate with manual and voltage-controlled **WIDTH**, as well as a simultaneous decay envelope that tracks the **WIDTH** controls.

While dedicated **PULSE** and **ENV** outs provide the static Gate and Decay Envelope, an integrated *digital* VCA offers the ability to control the velocity dynamics of these signals individually via a dedicated Dynamics Output (**DYN OUT**). The Dynamics VCA is not limited to operating on the integrated **PULSE** or **ENV**. Any external signal may be velocity controlled via the **EXT IN** jack and toggling to the proper selection via the **DYNAMICS** switch.

A fourth handy sample-and-hold output labeled **STEP**, returns the instantaneous voltage sampled directly from the Dynamic VCA's **LEVEL** control voltage input.

The digital VCA is triggered whenever the signal patched into **TRIG** or **EXT IN** (via normalization) exhibits a positive zero crossing, which then synchronously samples the CV patched into the **LEVEL** input. The voltage controlling the VCA is held for the duration until the next trigger or zero crossing is detected. Therefore, any signal's velocity may be discretely amplitude controlled using the Dynamics VCA.

VARIABLE PULSE and ENV CONVERSION:

To produce a variable width Gate Pulse or Decay Envelope – Patch any signal that passes through zero volts in the positive direction into the **TRIG** input.

Select the range of duration for your desired Gate Pulse or Decay Envelope via the **RANGE** switch.

SHORT = 0.1ms to 40ms

MED = 10ms to 2.25s

LONG = 50ms to 15s

Use the **WIDTH** slider to set your desired Gate Pulse-Width or **ENV** Decay time. You may apply voltage control for this feature via the **WIDTH** CV input. Use the attenuator to trim the CV. The **WIDTH** slider behaves as an offset control: **WIDTH** generally responds to positive CV, bipolar CV sources may also be fully utilized by providing *offset* via the associated slider.

The static amplitude Gate Pulse and Decay Envelope are simultaneously available by patching out of the respective **PULSE** and **ENV** outputs.

The full range of the **WIDTH** control is operable on **TRIG** input frequencies up to about 5kHz. Higher frequencies will exhibit less range via the **WIDTH** control.

TIP: *You can patch audio rate signals into **TRIG** to achieve PWM effects from the **PULSE** output. Also try the **ENV** output for a softer sounding PWM effect.*

IMPULSE DYNAMICS

The right side of the module governs the digital VCA. Select the input to the VCA using the **DYNAMICS** switch. You may choose to route the internally produced **PULSE** or **ENV** into the VCA, or any external signal patched into the **EXT IN** jack.

The Dynamics VCA static level can be manually controlled using the **LEVEL** slider.

Patch a dynamic signal into the **LEVEL** input. Use the attenuator to trim the applied CV and **LEVEL** slider to offset. The VCA responds to positive voltages. You can use the **LEVEL** control to *bias* the VCA with an offset to fully utilize bipolar control voltages. The VCA exhibits a linear response to CV.

Use the **DYN OUT** jack to grab your dynamic signal and patch out.

Impulse Dynamics utilizes an analog implementation of a digital VCA, it does not exhibit zipper noise associated with low resolution sample rates. Therefore, the VCA serves well as a general amplifier for audio.

You may also choose to use the **STEP** out for additional S&H modulation for external modules. The sample source will be whatever you have patched into the **LEVEL** jack.

To SYNC the S&H trigger to an external signal such as a VCO or external modulation signal; leave the **TRIG** input un-patched while the **EXT IN** is being utilized.

***TIP:** You can use the Dynamics VCA to sync external CV or audio so that the VCA is only active during the external signal's positive zero crossing. For example, patch CV or audio into the EXT IN. Set the DYNAMICS input to EXT IN. Patch an envelope into LEVEL. The result from DYN OUT will be synced to the external input's positive zero crossing – allowing for one sample per wave cycle. Please note that patching a signal into TRIG will disrupt this process.*

***TIP:** Following from the patch example above; you can use Impulse Dynamics as a traditional S&H by patching your sample into the LEVEL input, and sample trigger into the TRIG input. Patch the sampled voltage out of the STEP output.*

TECHNICAL

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 won't do anything if you do. Just unplug it and attach the power cable correctly if this happens.

Maximum Power Consumption: +38mA, -15mA