ADDAC System

Instruments for Sonic Expression

Est.2009

INTRODUCING

ADDAC816 PERCUSSION VCA

USER'S GUIDE . REV01

August.2025

ADDAC System

From Portugal with Love!

Welcome to:
ADDAC816 PERCUSSION VCA USER'S GUIDE

Revision.01 August.2025

DESCRIPTION

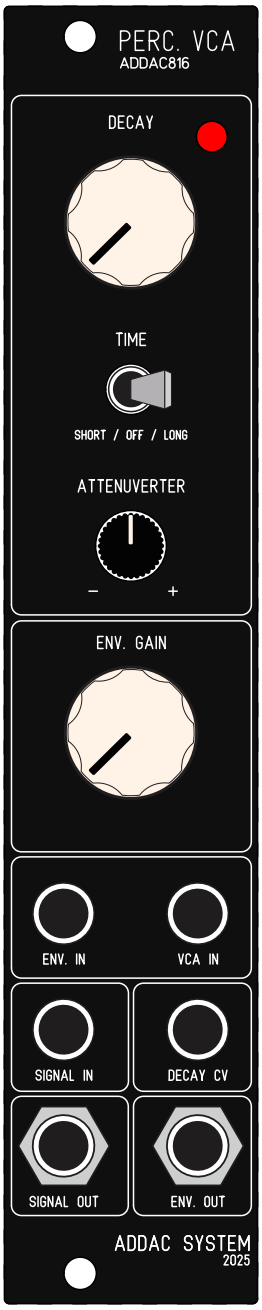
While deep in its soul there's a standard VCA with exponential response that can be used as such, in its heart pulses an AD envelope with a sharp attack and a variable decay internally connected to the VCA control input. When it opens its mouth it can whisper in your ear but don't let this soft demeanor fool you, if driven to the extreme it will show its teeth and gnarly bite and chew on your cochleas with all its might.

The AD envelope has a fixed short Attack, just enough to avoid the typical "click" that happens when using a Gate signal to control a VCA, while the envelope Decay can be controlled via its knob or voltage controlled using the CV input and attenuverter.

We named it Percussion VCA as most percussion intruments have sharp attacks with variable decays just as its AD Envelope however it can be used for any purpose where a VCA is needed including for CV signals due to it's DC coupled signal path.

Furthermore it also allows to be driven from a simple Gate signal while controlling its decay. This way it's easy to plug a noise source, vco or any audio and turn that source into a percussive element.

This module will also be available as a full DIY kit..



Tech Specs:
5HP
4 cm deep
80mA +12V
80mA -12V

FRONTPANEL

The envelop features an input with an [ENV. GAIN] knob which at maximum can amplify the incoming signal by a factor of 50. **This is a very important control (more about it in the next page)**.

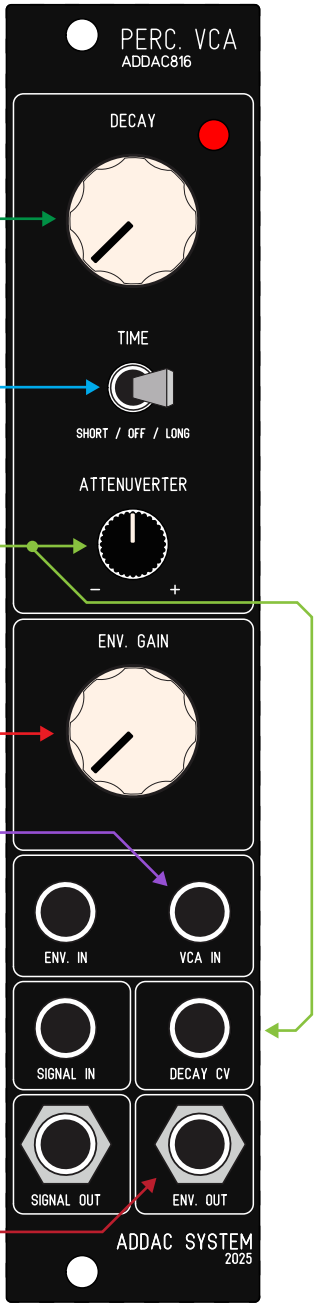
The [ENV. IN] accepts any signal Trigger, Gate or CV. Whatever input is plugged in the signal is then fed through a slew circuit with a very short Attack and controllable Decay through the [ENV. DECAY] knob.
The Decay can also be controlled using the CV Input and Attenuverter knob.

The Decay Range can be set using the [TIME] switch. With the Decay switch set to OFF only the short attack is kept and no decay is applied.

The resulting envelope signal is then used to control the VCA. The envelope is also sent to the [CV OUT] as well as the LED monitor at the top.

The [VCA IN] input is a direct input to the VCA bypassing the AD envelope. In this case the [ENV. GAIN] works as an offset.

The [SIGNAL IN] & [SIGNAL OUT] carries the signal path, it can be used for audio or CV sources.



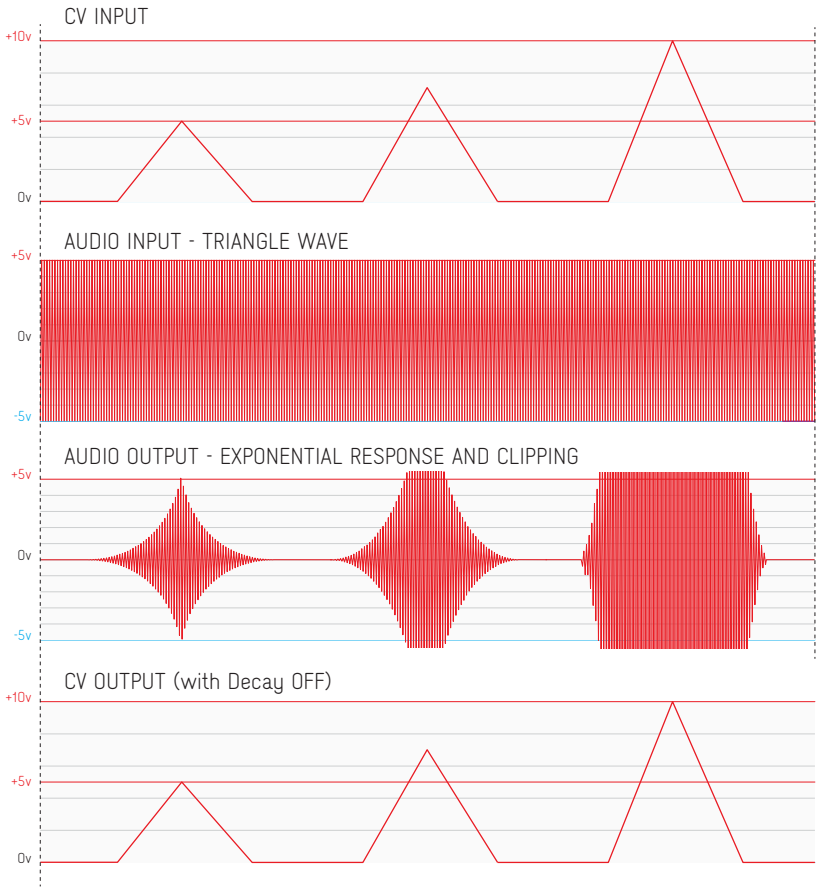
ENVELOPE GAIN

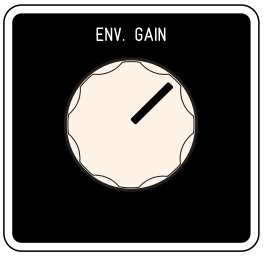
Usually Attack/Decay envelopes have a maximum voltage of +5v, no matter if the input gate is +5v or above the AD will clip at +5v. In this case we did not use this clipping method and instead allow the incoming voltage to determine the maximum AD voltage, meaning that if a +5v gate is present then the AD maximum voltage will be +5v but if a gate of +10v is sent then the AD maximum voltage will be +10v. This also means that with higher input voltages the decay, although falling at the same speed, will be longer than with lower voltages as it has a longer range to go back to 0v.
As we mentioned before the [INPUT GAIN] knob can amplify the incoming input up to a factor of 2, allowing to use a standard +5v gate or envelope and being able to make the resultant AD go up to +10v.

The AD signal is responsible for opening the VCA.
Up to +5v the VCA will open to unity gain above this value the VCA will start to amplify and eventually saturate and distort.

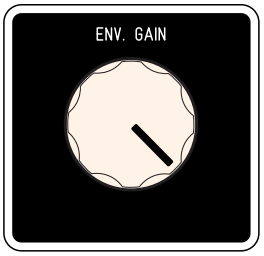
VCA RESPONSE & LIMITER

Below we show a graphic showing the exponential response of the VCA.
Also shown are the knob positions with respective amplification factor, at about 1:30 o'clock the gain is 1:1 from this position up to fully CW the amplification will exponential grow up to it's maximum amplification of 50 allowing to fully distort the input signal.
To avoid extreme volumes we use clipping diodes to limit the signal to aprox. ±5.5v





x1 Amplification
(Unity gain)



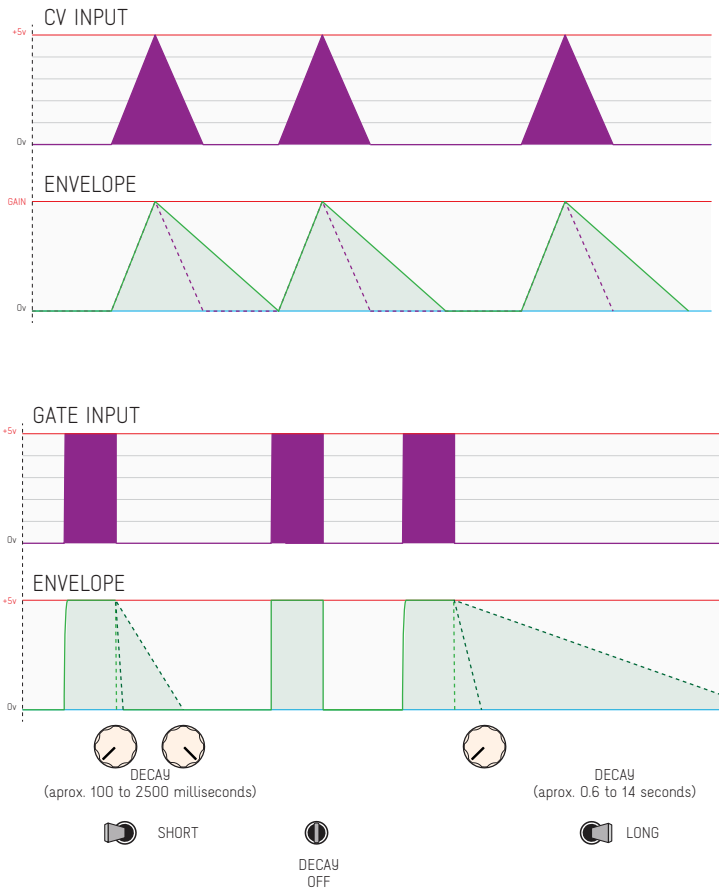
Amplification
x2 Envelope
x50 Signal

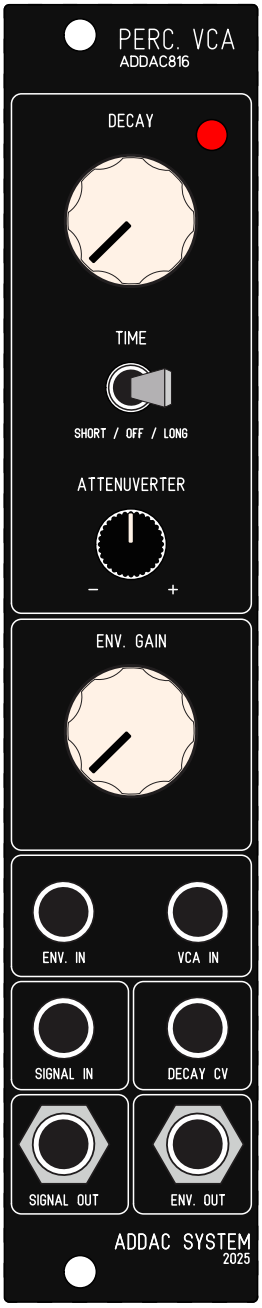
DECAY TIME

The Decay time is set using the [TIME] switch.
There's 2 diferent ranges Short and Long while Off disables the Decay.
Short range goes from 10 to 1000 milliseconds
Long range goes from 1 to 10 seconds

These two ranges are factory calibrated via a trimmer on the side of the module. Users can change the factory setting in order to make the Decay ranges either shorter or longer.

Here's a couple graphics showing the Decay action when using a CV or Gate input

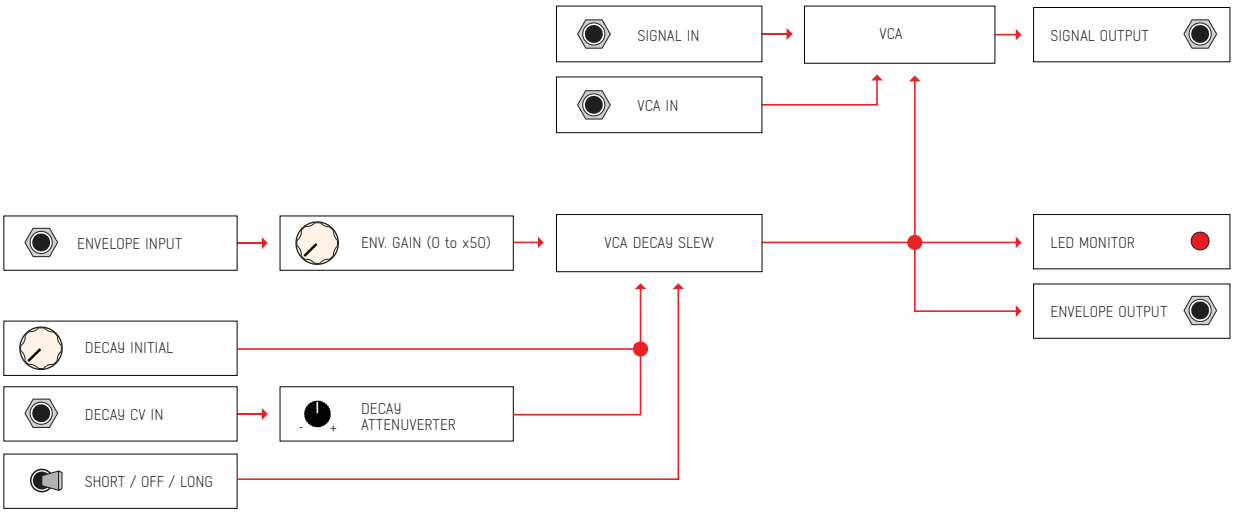




VCA INPUT

The VCA input bypasses the Envelope and goes straight into the VCA volume control with no attenuation. In this case the [ENV. GAIN] works as an offset to the VCA Input.

SIGNAL FLOW DIAGRAM



For feedback, comments or problems please contact us at:
addac@addacsystem.com

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