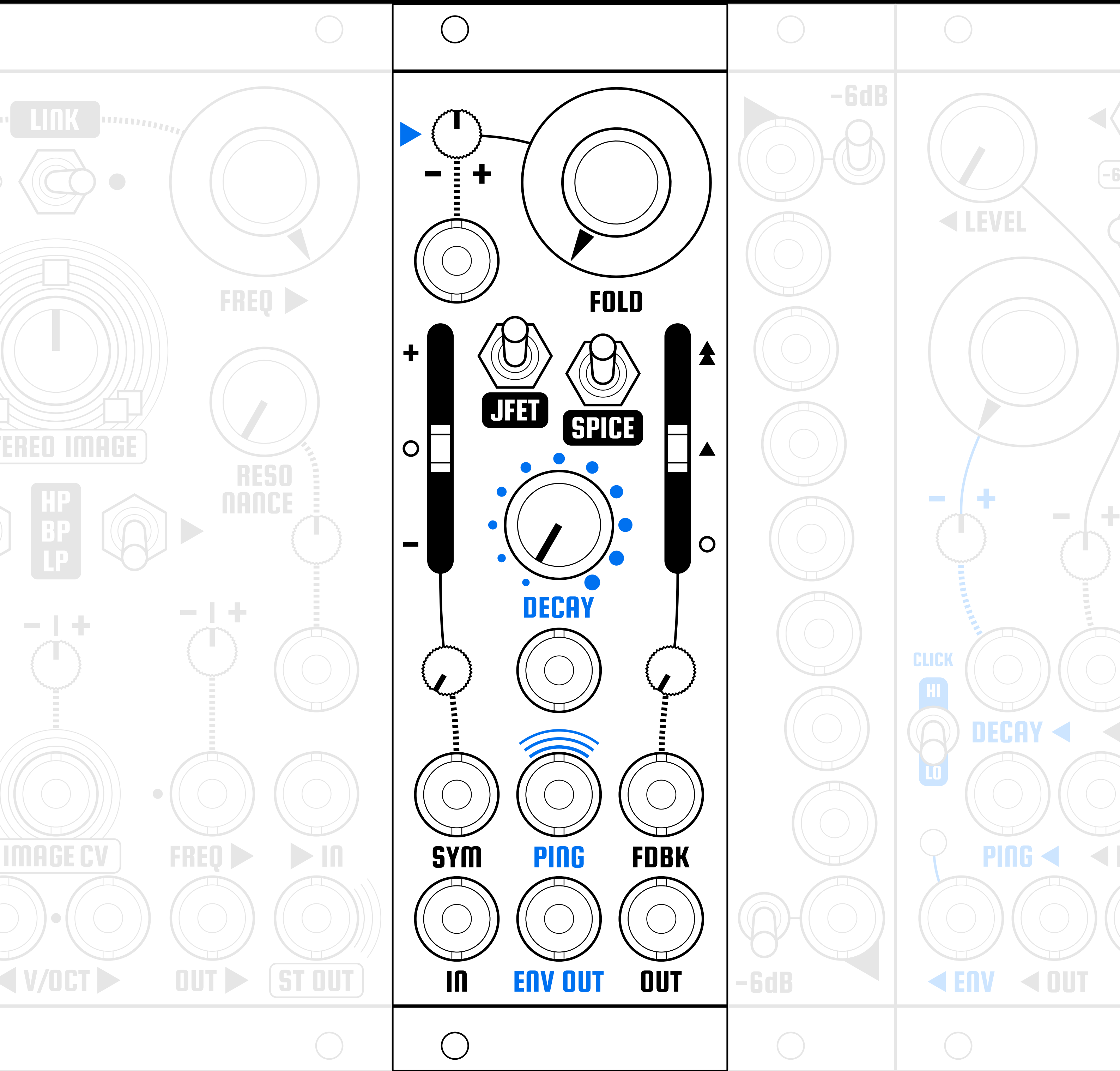
FOLDIST

Spicy wavefolder



User manual

olivella modular

Introduction

olivella modular FOLDIST is a wavefolder with an integrated VC **DECAY** envelope generator and a spicy feedback circuit. The switchable **JFET** input stage overdrives and shapes the input before the wavefolder, allowing for pulse / square wave folding (!). **SYM** adds an offset into the mix, allowing from clean and even folding to asymmetric and dirty, while **FDBK** cranks up the chaos by feeding the output back into itself. The **SPICE** switch routes the feedback through a full-wave rectifier, making everything rougher and less predictable.

PING turns almost any signal into a suitable trigger for the envelope generator, normalled to the **FOLD** CV input. There's also an **ENV OUT** if you want to use it elsewhere. This thing it's all about pushing harmonics into weird places. Whether you want subtle folds or unstable feedback and audio / CV destruction, **FOLDIST** delivers.

Features

- Serge-type wavefolder
- Bipolar **SYM** slider with CV input and attenuator
- **FDBK** slider with CV input and attenuator
- **JFET** input stage overdrives and shapes the incoming signal before the wavefolder
- **SPICE** routes the feedback through a full-wave rectifier for a more untamed sound
- VC **DECAY** envelope generator normalled to the **FOLD** CV input, with **ENV OUT**
- **PING** input that converts almost any signal into a suitable trigger for the internal EG

Details

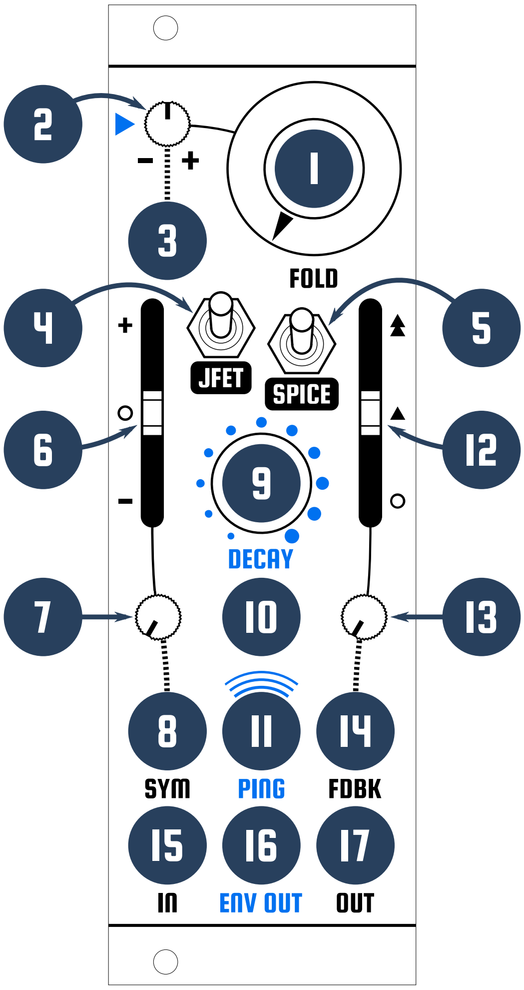
- Fully DC-coupled, except when **JFET** is engaged
- All inputs allow DC to audio-rate signals
- Input impedance: 100 kΩ
- Output impedance: 510 Ω

- Width: 8 HP
- Depth: 25 mm
- +12V: 55 mA
- -12V: 55 mA
- Reverse power polarity protection

Installation

- Check that your Eurorack synthesizer is **powered off**.
- Connect the 10 pin side of the power cable to the 2x5 pin power header on the back of the module, **making sure that the red stripe on the cable is connected to -12V** (as shown on the back of the module).
- Connect the 16 pin side of the power cable to a free 2x8 pin power header on your Eurorack power supply, again **making sure that the red stripe on the cable is connected to -12V on your power supply**.
- Mount the module in your Eurorack case.
- Power it on!

In case that the power cable gets installed backwards **the module will not get damaged** because it features reverse power polarity protection, but it won't work plugged the wrong way around.

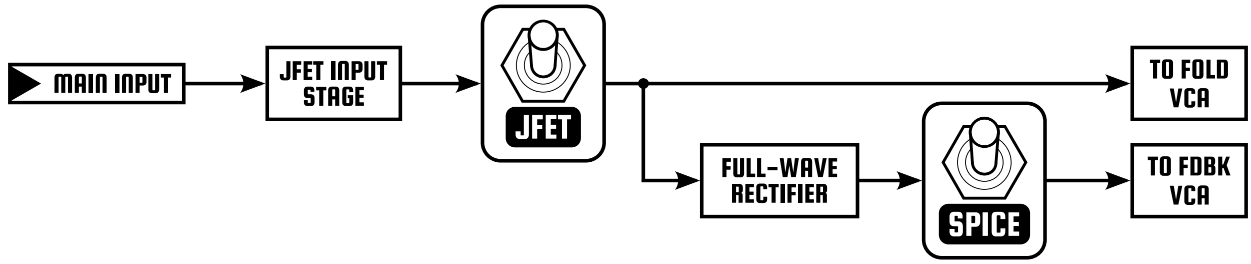


Panel overview

1. FOLD knob (0V to +10V range)
2. FOLD CV attenuverter
3. FOLD CV input (normalled to ENV)
4. JFET switch
5. SPICE switch
6. SYM slider (-5V to +5V range)
7. SYM CV attenuator
8. SYM CV input
9. ENV DECAY knob (0V to +10V range, attenuator for 10 when patched)
10. ENV DECAY CV input
11. ENV PING input
12. FDBK slider (0V to +10V range)
13. FDBK CV attenuator
14. FDBK CV input
15. Main input
16. ENV output
17. Main output

Input stage

Block diagram



JFET

The **JFET switch will engage this circuit on its down position**, while it'll bypass it when up.

This stage consists of a discrete transistor circuit that **applies a moderate amount of overdrive** to its input signal. Due to the nature of JFET transistors, mostly **even harmonic distortion / asymmetrical clipping** is produced, similar to that generated by vacuum tube-based equipment – which some consider more "pleasing" or "musical" compared to odd harmonic distortion / symmetrical clipping.

This distortion and the fact that the circuit itself shapes the signal a bit due to AC-coupling (DC-blocking high-pass filtering) **makes wavefolding of square and pulse waves possible**.

The **JFET_GAIN trimmer** in the back of the module sets the **JFET** stage's output gain. In its factory setting, it matches the output levels of bypassed and processed signals RIGHT before the first fold takes place. This avoids sudden jumps in amplitude—and therefore folding—when activating **JFET**, but feel free to adjust it to taste if you do want more (or less) amplitude when engaging it.

SPICE

The **SPICE switch will engage this circuit on its down position**, while it'll bypass it when up.

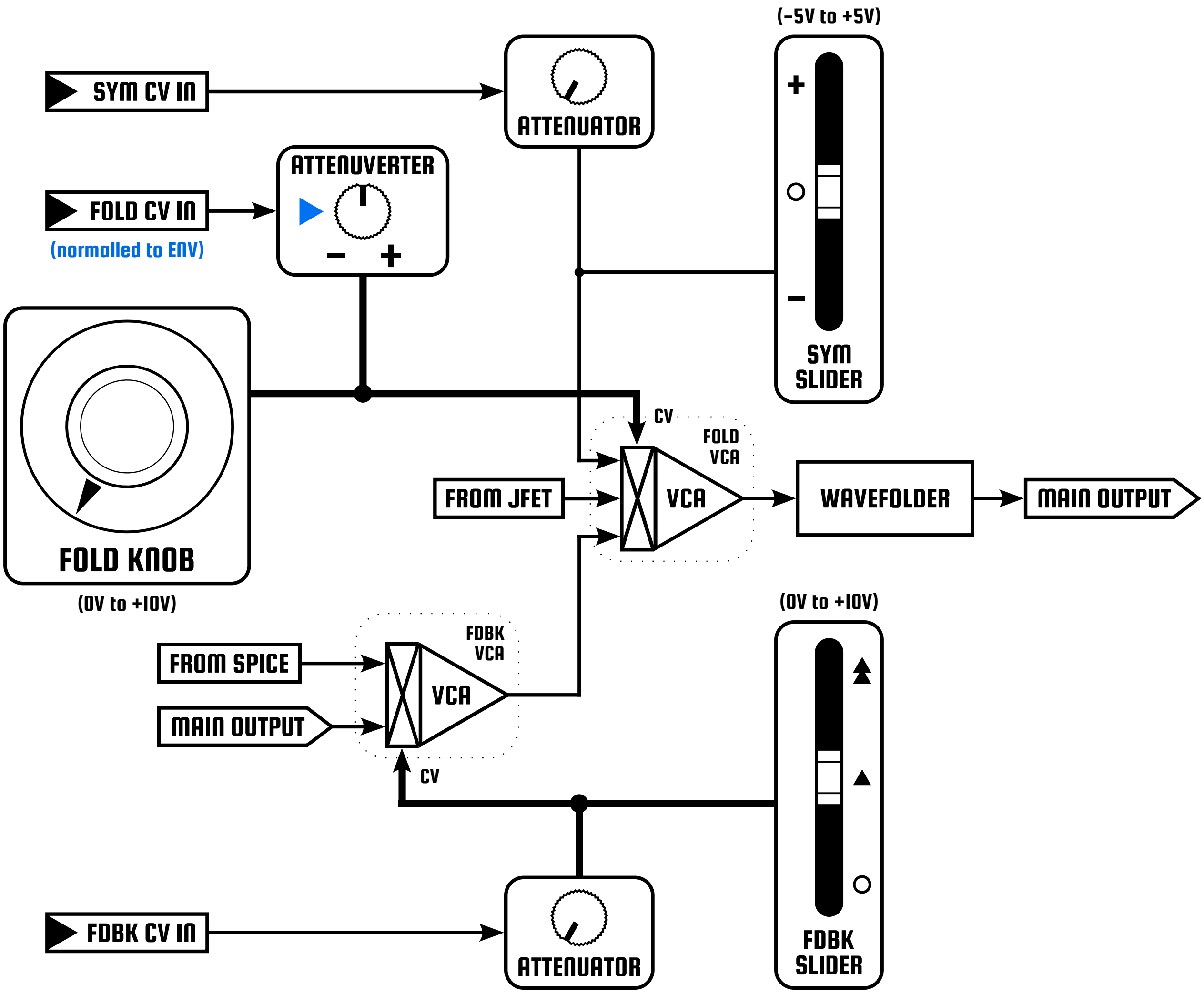
The **SPICE** circuit consists of a modified **full-wave rectifier followed by a simple RC high-pass filter**.
Simply put, the FWR detects when the incoming signal goes negative (below 0V) and flips that section of the waveform into the positive side (above 0V) yielding a positive-only waveform, while the RC filter centers it back around 0V. Both processes have the effect of **waveshaping the signal and making it "rougher" sounding**.

This resulting signal, when later summed with the wavefolder's feedback at the **FDBK** VCA allows for a **more unpredictable operation and a "spicier" sound**, with lots of sweet spots and experimentation possibilities to be found.

As shown on the block diagram, the circuit only affects the **FDBK** section – so **if FDBK its at zero / not being modulated, SPICE will not have any effect on the output**. Also, since the **JFET** stage feeds this circuit its behavior will change depending if it's active or bypassed.

Wavefolder

Block diagram



This is **the core of FOLDIST** – where the magic happens to happen (??).

FOLD VCA

This VCA has three inputs: the main **input signal after the JFET stage**, active or bypassed; the mix of the **SYM slider and its CV input**; and the **FDBK VCA output**.

The **mix of the FOLD knob and CV input** control the gain of the **FOLD** VCA, which determines the wavefolder input amplitude and, in turn, the **amount of folding applied** to the signal.

The **FOLD** CV input features an attenuverter and its jack is **normalled to the internal envelope generator** when unpatched.

SYM CV

The **SYM** slider and its CV input **offset the signal before the wavefolder**, shifting the upper and lower points where the waveform begins folding into itself.

This **alters the wavefolder's tonal characteristics** and expands its harmonic possibilities – ranging from fixed voltages set by the **SYM** slider and subtle LFO movements to fuzz-like clipping and audio rate modulation.

Since the **SYM** CV input is mixed as an input signal, it can be used as a **secondary audio input** to the wavefolder.

FDBK

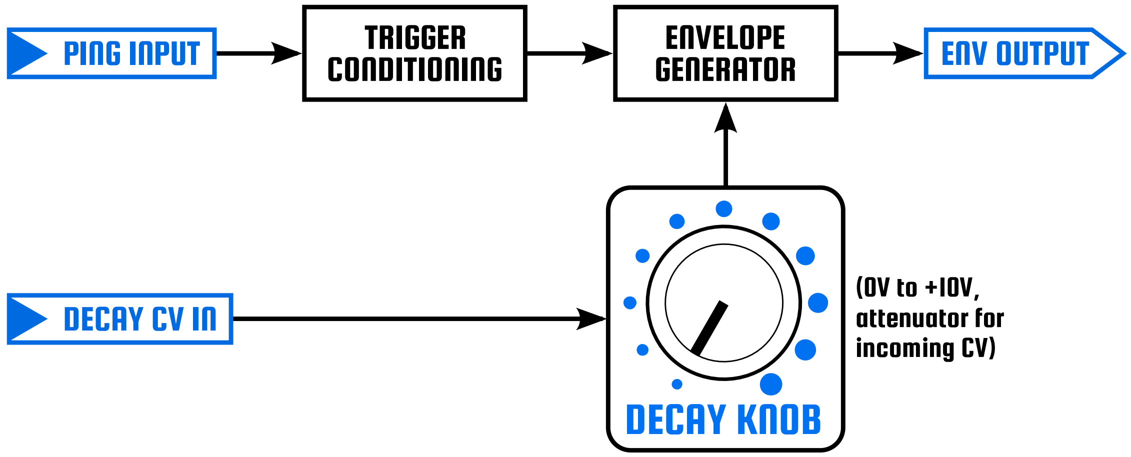
This **FDBK** VCA has two inputs: the main **input signal after the SPICE stage**, active or bypassed; and the **main output's feedback**.

The **mix of the FDBK slider and CV input** control the gain of the **FDBK** VCA, controlling the amount of feedback going to the **FOLD** VCA.

The more feedback is applied to the system, the **more aggressive and unpredictable** the output will be, especially if **SPICE** is engaged.

Envelope generator

Block diagram



Trigger conditioning (PING input)

This comparator based circuit converts any **rising-edge, higher than +4V periodic signal** present at the **PING** input into a suitable short trigger for the internal envelope generator – even at audio rates.

As this is a level-dependent circuit, **varying the gate / trigger voltages will affect** the resulting envelope's amplitude accordingly.

Envelope generator

Generates an AD envelope with a **fixed, plucky attack** and an exponential, **vactrol-like VCable decay** time.

The **DECAY knob turns into an attenuator** when a control voltage is patched into the jack below it.
Given a CV input of -10V, the minimum possible envelope time is **200ms**, while the maximum time (with a CV input of +10V) is about **5 seconds**.

As previously mentioned this AD envelope is **normalled to the FOLD CV input** and attenuverter, as well as having its own **dedicated output** —**ENV OUT**— for self-patching or to distribute around your system.