Wildsync ADSR 4001 Envelope Generator Module Manual

The **Wildsync ADSR 4001** is designed to create envelope signals in the ADSR (Attack, Decay, Sustain, Release) format for use in analog synthesizers and modular systems in the Eurorack standard. It offers flexible time parameter control and can operate in both classic ADSR mode and AD (Attack-Decay) mode with a looping function, turning it into an LFO.

Controls Overview

Knobs:

- **ATTACK** – controls the attack time (the rise in signal level from 0 to maximum).
- **DECAY** – adjusts the time it takes for the signal to fall from maximum to the **SUSTAIN** level.
- **SUSTAIN** – sets the level that is maintained after the **DECAY** phase while the **GATE** signal is active.
- **RELEASE** – controls the time it takes for the signal to decay after the **GATE** signal is deactivated.

Inputs:

- **GATE** – trigger input to start the envelope cycle. When a **GATE** signal is received, the envelope cycle begins. Connecting the **GATE** to a gate source, such as a MIDI keyboard or sequencer, will trigger either the **ADSR** or **AD** cycle, depending on the mode switch position.
- **RETRIG** – allows the envelope to restart at any phase upon receiving a new **GATE** signal.

Outputs:

- **OUT** – main envelope output (provides the standard ADSR signal).
- **INV** – inverted envelope output, where the phase and polarity of the signal are reversed (e.g., the **ATTACK** phase goes downward instead of upward).

Button:

- **MANUAL GATE** – a button to manually trigger the **GATE** signal. When pressed, it simulates the reception of a **GATE** signal, allowing you to trigger the envelope manually without an external gate source.

Switches:

- **S-M-L** (Short, Medium, Long) – adjusts the time scale for the **ATTACK**, **DECAY**, and **RELEASE** phases. In the **S** (Short) position, the time parameters are minimized, making the envelope fast and sharp. In the **M** (Medium) position, moderate time settings are applied. In the **L** (Long) position, the duration of all phases is extended, making it ideal for smooth envelopes with long attacks and decays.
- **AD-ADSR** – switches between two operating modes.

    - **AD** – in this mode, only the **Attack** and **Decay** stages are active, and the signal returns to zero regardless of the **GATE** signal status.
    - **ADSR** – the standard four-stage envelope mode, where the **SUSTAIN** phase is held as long as the **GATE** signal is active.
- **LOOP-SINGLE** – toggles between looped and single-shot modes.
    - **LOOP** – enables looping in **AD** mode, turning the module into a cyclic signal generator (LFO).
        - If no **GATE** signal is connected, the envelope will loop automatically.
        - If a **GATE** signal is connected, the looping occurs only while the **GATE** is held.
    - **SINGLE** – in this mode, the envelope runs once when the **GATE** signal is received, without looping.

Usage Examples

1. **Classic ADSR envelope for controlling a filter or amplitude**:
    - Set the **AD-ADSR** switch to **ADSR** mode.
    - Connect the **GATE** input to a sequencer or keyboard.
    - Adjust the **ATTACK**, **DECAY**, **SUSTAIN**, and **RELEASE** knobs to shape your desired envelope.
2. **Using the module as an LFO**:
    - Switch to **AD** mode.
    - Set the **LOOP-SINGLE** switch to **LOOP**.
    - Disconnect the **GATE** input. The envelope will begin looping, creating cyclical modulation that can be used as an LFO for other parameters.
3. **Generating short envelopes for percussive sounds**:
    - Set the module to **AD** mode.
    - Switch the **S-M-L** to **S** (Short) for quick time settings.
    - Adjust the **ATTACK** and **DECAY** for a fast envelope, ideal for modulating amplitude or pitch in drum or percussion modules.

Hidden Features and "Easter Eggs" of the Wildsync ADSR 4001 Module

In addition to the standard functions, the **Wildsync ADSR 4001** module includes a few hidden features that advanced users can unlock by performing minor modifications. These "easter eggs" allow for fine-tuning the envelope's time characteristics and output behavior.

1. Increasing the Time Characteristics in M Mode

You can extend the time parameters of the envelope in **M** (Medium) mode by making a small modification to the module's internal components:

- **Add a capacitor C16 in parallel with capacitor C14**. Capacitor C14 controls the time scaling in the **M** mode, and by adding another capacitor (C16) in parallel, you can increase the total capacitance, thus extending the envelope's time characteristics.
- Alternatively, you can **remove capacitor C14** and experiment with different values for capacitor C16 to achieve the desired time characteristics in **M** mode. This gives you more precise control over the module's behavior.

2. Modifying the INV Output Voltage Range

By default, the **INV** (inverted envelope) output provides an inverted signal in the range of **0 to -8V**. However, you can modify this behavior to output the inverted envelope in the range of **0 to 8V** by performing the following mod:

- **Solder the jumper SJ1** on the module's circuit board. This simple modification shifts the output range of the inverted envelope, allowing for positive inversion rather than negative.

These "modding" options provide greater flexibility for advanced users, allowing them to tailor the module's performance to specific needs and experiment with different envelope characteristics. Always be cautious when performing hardware modifications and ensure you have the necessary skills to avoid damaging the module.

Conclusion

The **Wildsync ADSR 4001** module offers flexible options for creating standard ADSR envelopes as well as advanced looping patches. Whether you're modulating sound parameters or generating complex LFO patterns, this module can be a powerful addition to your Eurorack system.