



# PLUM AUDIO – ADVA

3U User Manual, rev 1.1 (GREENY Firmware)

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## ADVA – INTRODUCTION



**ADVA** is a fat-sounding 24dB **ANALOG MULTIMODE FILTER** packed with features including a **VCA**, **white noise generator**, pre and post-**distortion** circuits and a smart digital interface that makes it a versatile beast in a surprisingly small package.

With 7 filter modes, **ADVA** provides high richness and a wide variety of tones; it can filter gently like an LPG or it can be pushed up to the edges of hot acid tones.

Unlike many other multimode filters, a **phase keeper** circuit ensures that **ADVA** never inverts the input's phase in any of its filter modes.

**Self-Oscillation** is available for all modes, producing a range of waves from clean sine waves up to soft square waves when activating the post-distortion circuit. Together with **V/OCT** tracking, **ADVA** works brilliantly as an oscillator or as a percussive sound generator.

A **resonance loudness compensation** circuit ensures that **ADVA** does not compromise on volume when the resonance is increased.

An **Internal analog white noise generator** is the little bit of spice that can make the world of difference. Blend it together with the input signal by rotating the dedicated knob to add more richness to your sound and further emphasize cutoff movements, or use it as an FM source to achieve the different flavors of dirty tones.

**ADVA** is packed with **two separate distortion circuits**. First, the soft-clipping **overdrive** is located in the sound path after the white noise blend knob and the input gain knob, a circuit which can push the incoming signal to thicken any waveform. If you blend the input with the noise generator it can compress the noise and exaggerate it to achieve more aggressive levels.

The second (post) **distortion** circuit is located after the VCA, just before the output. This is a more aggressive distortion and can be used for acid and other dirty hot tones.

Although the sound path is completely analog, **ADVA** has a digital support circuit that enables a **smart routing system** with the option to **modulate filter modes via CV**, and a very intuitive interface that includes 3 **CLICKKNOBS** and an **RGB LED** ring that provides visual feedback for whatever state the filter is in.



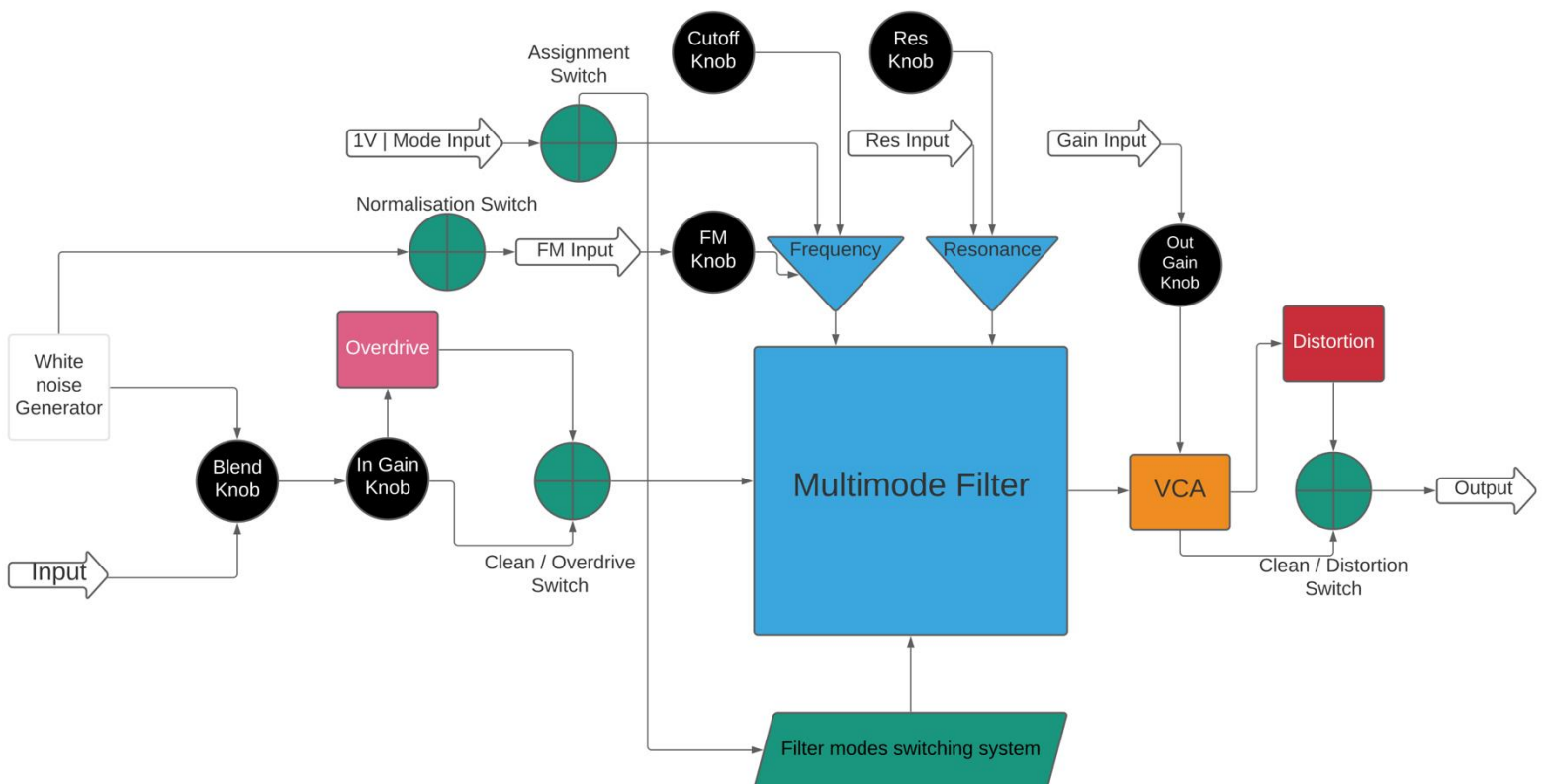
## Installation Instructions:

- Before connecting **ADVA**, make sure to **turn off and disconnect your case from its power supply**.
- Connect one end of the ribbon cable provided to the power header of **ADVA**, and the other end to your case's power busboard.  
NB: Ensure the red stripe on the ribbon cable (-12V side) is facing the same way as the “Red Stripe” marking on the header.
- Use the 2 screws provided to mount **ADVA** to an available 6HP space your Eurorack case.

## Power Supply Requirements:

- **ADVA** requires a **-12V/+12V** power supply (2x5 pin connector).
- **ADVA** draws a maximum of 110mA from the **+12V** rail, depending on LED brightness, and a consistent 50mA from the **-12V** rail.

## ADVA - SOUND PATH CHART:

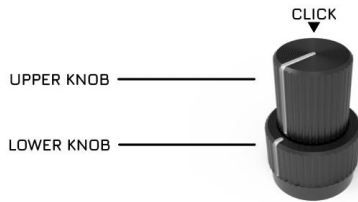




## ADVA - INTERFACE:

The **ADVA** Interface includes 3 "**CLICKKNOBS**" — Plum Audio’s custom dual concentric knobs with push buttons. This special interface component allows us to keep the module size small whilst at the same time ensuring a convenient and intuitive interface.

### Physical “CLICKKNOB” options:

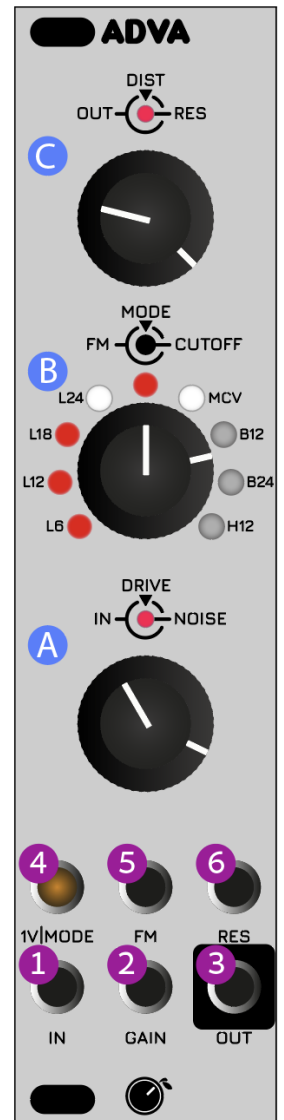


### Panel graphics:



## INPUTS AND OUTPUTS:

1. Audio Input.
2. Gain Input – This is the CV input for the Internal VCA. When nothing is patched to this input, the VCA is fully open.
3. Output.
4. 1V | Mode – By default, this input is used as a second cutoff modulation. This input is not affected by the FM attenuverter and allows tracking using the V/OCT scale.  
You can reassign this input to change the filter modes. To understand how this works, please see the "Advanced Topics" section in this manual.
5. FM Input – CV Input for cutoff modulation. The signal from this input is processed by the FM attenuverter (Lower B Knob). When the FM attenuverter knob is turned fully clockwise, the cutoff will be tracked using the V/OCT scale.  
This input is normalized to the internal white noise generator, meaning that when nothing is patched in, the FM attenuverter will be used to modulate the cutoff with white noise.  
NB: If you wish to disconnect this normalization, please see the “Advanced Topics” section in this manual.
6. Resonance CV Input.





## CONTROLS:

- A. Click:** Activate / Deactivate the drive circuit.

**Upper Knob:** Noise Blend – Allows blending of the input signal with the internal white noise generator.

When turning this knob clockwise, the input signal will be attenuated on a non-linear scale. The non-linear response of this knob allows for a sweet spot of around 50% where there is relative equality between the incoming signal and the noise while maintaining an almost full gain of the incoming signal.

When this knob is fully open (turned clockwise) only noise will pass through the filter. When it is fully closed (turned counterclockwise) only the incoming signal will pass through the filter.

**Lower Knob:** Input Gain – in the audio path this knob is located after the noise blend knob and is used to attenuate the signal passing to the filter. When the drive circuit is active, this knob will be used as the drive amount.

- B. Click:** Filter mode – Each click will cycle through the filter modes – LP6dB, LP12dB, LP18dB, LP24dB, BP12dB, BP24dB, and HP12dB.

The corresponding LED in the LED ring will light up in white, All other LEDs in the ring will give visual feedback on the filter Cutoff position, and each filter mode has its own color code.

**Note:** This clicking functionality is available only when **Click Lock** mode is disabled. For details about the **Click Lock** mode and how to toggle it, refer to the "Advanced Topics" section of this manual.

- C. Upper Knob:** Cutoff frequency – This is the main cutoff knob.

**Lower Knob:** FM Attenuverter – this knob is used to scale and invert the FM input signal. At the midpoint, the modulation is fully attenuated, rotating the knob clockwise will increase the amount of modulation and rotating counterclockwise from the mid-point will increase the amount of inverted modulation.

- D. Click:** Activate / Deactivate the distortion circuit.

**Upper Knob:** Resonance.

**Lower Knob:** Output gain – This knob is used as the attenuator of the VCA gain input. When nothing is patched to the gain input, this knob will act as the filter's output volume.

When the distortion circuit is activated the VCA can increase or decrease the amount of distortion using this knob.



## ADVANCED TOPICS:

Please be aware that certain procedures or features described in this section have been introduced or modified starting with the **GREENY firmware (v1.1)**. If you're using an earlier version of the firmware, some functionalities might differ or may not be present. Ensure that you're updated to the latest version to take full advantage of the described features and procedures.

### Identifying Your Firmware Version:

Upon powering the module, the LED ring will display a brief "light show" sequence, helping you identify the installed firmware:



#### v1.0 - Colorful Sequence:

If the LED displays a sequence of light green, yellow, orange, red, white, light blue, purple, and magenta, your module is operating with firmware v1.0.



#### v1.1 - Green with 3 Central White LEDs:

If the LED sequence is predominantly green and the three central LEDs are white, you're using the GREENY firmware v1.1.

Stay updated with the latest firmware versions to ensure optimal performance and access to all features. For updates, visit: <https://www.plum-audio.com/adva-firmware>

### CUTOFF CLICK LOCK MODE:

When performing live with the **ADVA**, there may be situations where you want to disable the click action of the Cutoff knob to prevent accidentally changing the filter mode.

#### Activating Click Lock Mode:

1. Simultaneously short press knobs **A** and **C**.
2. The LED at the center of the LED ring will illuminate in white, indicating that the Cutoff click is locked. In this mode, the module will not recognize presses on knob **B**.

#### Adjusting Filter Modes in Click Lock Mode:

- Even in Click Lock mode, you can adjust the filter modes:
  - Hold down the Cutoff knob (**B**).
  - For the next mode, short press the **C** knob.
  - For the previous mode, short press the **A** knob.

#### Deactivating Click Lock Mode:

- Again, simultaneously short press knobs **A** and **C**.
- The central LED on the LED ring will no longer display in white. Note that, depending on the Cutoff position, the LED might still illuminate in other colors.



## MCV – MODE CHANGE VIA CV:

The **1V | Mode** input (4) has the flexibility to be reassigned for controlling the filter mode.

### Activating MCV Mode:

1. Press and hold knobs **A** and **C** for approximately 2 seconds.
2. Once the **1V | Mode** input is designated to MCV:
  - The corresponding LED on the ring will illuminate in white.
  - The small LED inside the **1V | Mode** jack will also activate.

In the **MCV mode**, the module accepts a CV range of 0-5V. You have the ability to 'offset' the modes by manually transitioning between different modes.

### Deactivating MCV Mode:

1. Repeat the activation process (press and hold knobs **A** and **C** for about 2 seconds).
2. The LEDs associated with **MCV** will deactivate, signaling a reversion to its default **V/OCT** assignment.

### Note on MCV for ADVA:

**ADVA** employs swift switches to toggle between filter modes instantly. Consequently, there's no crossfade between these modes. This design can occasionally produce a discernible "click" sound during mode transitions, particularly at lower frequencies.

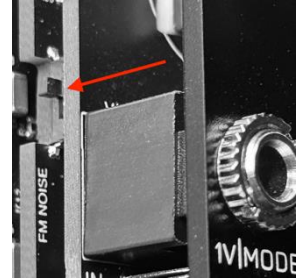
To mitigate or mask this 'click', **ADVA** is equipped with several tools. Here are general guidelines to help you smooth out the transition:

1. **Sequencer Synchronization:** Utilize a sequencer to align mode changes with your rhythm. This can mask the click within the rhythmic elements of your sequence.
2. **Envelope Modulation of VCA:** Modify the VCA using an envelope. By slightly increasing the 'Attack', you can soften the onset of the sound, potentially masking the click.
3. **White Noise Generator:** ADVA's internal white noise generator can be employed as a form of dithering. This will introduce randomness that can effectively suppress the click.
4. **Filter Modulation:** Actively modulating the filter parameters can eliminate the click. When these parameters are dynamic, the transient click becomes less noticeable.
5. **Distortion Utilization:** Engaging distortion and pushing it into the clipping range can overpower the click, rendering it inaudible.



## DISABLE / ENABLE NOISE NORMALIZATION TO THE FM INPUT:

Release the mounting screws and take off the module from your case to access the small slide switch, located on the left side of the module, on the central circuit board. This switch will disconnect the noise normalization.



## V/OCT CALIBRATION PROCEDURE:

The filter is designed to effectively track over 4 octaves. However, please note that it is not temperature-stabilized.

**Warm-Up:** Before calibration, allow the module to warm up for approximately 20 minutes to ensure optimal performance.

**1. Cutoff Setting:** Turn the cutoff knob to roughly the 10 o'clock position. The exact position isn't critical.

### 2. Resonance & FM Settings:

- Rotate the resonance knob to its maximum setting.
- Ensure no input signal or FM modulation CV is connected.
- Set the FM attenuverter to its midpoint (or, alternatively, disable noise normalization).

### 3. MCV Mode & Connection:

- Deactivate the MCV mode.
- Connect the note CV output from a properly-calibrated keyboard interface or MIDI-CV converter to the 1V | MODE input.

### 4. Tone Monitoring:

- Listen to the tone emanating from the output. or alternatively, employ a tuner for precise monitoring (You can use any filter mode).

### 5. V/OCT Trimmer Adjustment:

- On the modules's reverse side, locate the V/OCT trimmer.
- Adjust it until the musical intervals played on the keyboard match the output. The exact note values aren't essential; however, when you play an octave on the keyboard, the output should unmistakably sound like an octave.

**6. Post-Calibration:** Once the V/OCT calibration is complete, proceed with the LED ring calibration.





## LED Ring Calibration (Post V/OCT Calibration):

After completing V/OCT calibration, it is crucial to calibrate the LED ring for accurate visual feedback due to changes in the values that the Cutoff knob sends to the microcontroller.

### 1. Entering LED Configuration Mode:

- Disconnect all modulation signals directed at the cutoff (both FM and V/OCT).
- Set the FM attenuverter to its mid-point position (or, alternatively, disable noise normalization).
- Ensure the Click Lock mode is disabled.
- To enter LED Configuration Mode: Press and hold the Cutoff knob (B) for about 4 seconds.

### 2. Performing LED Ring Calibration:

- **Set Minimum Value:**
  - Rotate the Cutoff knob to its minimum setting (counterclockwise) and press Knob **A**.
- **Set Maximum Value:**
  - Rotate the Cutoff knob to its maximum setting (clockwise) and press Knob **C**.

## ADJUST LED BRIGHTNESS:

LED brightness can be adjusted at any time as per your preference.

### 1. Entering LED Configuration Mode:

- Follow the same steps as above to enter LED Configuration Mode.

### 2. Adjusting Brightness:

- To **increase** brightness, rotate the Cutoff knob clockwise.
- To **decrease** brightness, rotate the Cutoff knob counterclockwise.

## Notes:

- Within the initial 10% of the knob's rotation when turned fully counterclockwise, the cutoff meter will be deactivated. In this setting, the LED ring will exclusively display the current filter mode, MCV mode, and Click Lock mode.
- LED brightness directly impacts the module's power consumption:
  - At full brightness, the module draws 110mA from the +12V rail.
  - At 50% brightness, it draws only 85mA.
  - At minimum brightness, it draws less than 75mA.

## Exiting LED Configuration:

To exit the LED Configuration Mode, give a short press on the Cutoff knob (**B**).



**ADVA IS AVAILABLE IN 3U/6HP AND 1U/22HP FORMATS WITH BLACK OR SILVER FRONT PANELS:**

