# Polaris Manual

Overview

The Polaris filter features 3 fixed mode outputs with commonly used filter types as well as a multi output that can be configured to be any one of 26 different filter types. A distortion circuit can also be enabled to give the multi output an aggressive edge.

Installation

See the Module Installation Guide for instructions on installing the module in your Eurorack modular system.

Front Panel
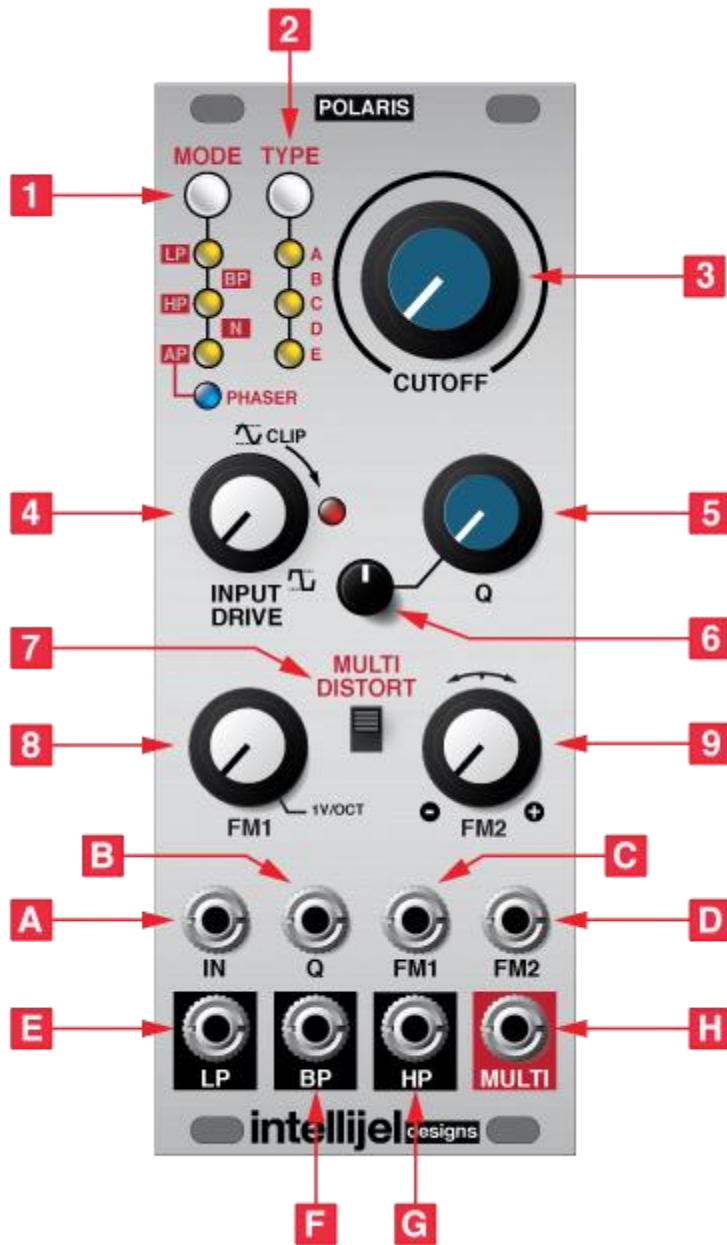
Controls

1. **MODE**
   This button cycles between the different filter modes of the **MULTI** output. The LEDs below the button indicate the currently selected mode. The modes are LP (Lowpass), BP (Bandpass), HP (Highpass), N (Notch), and AP (Allpass). After AP there is a 6th "PHASER" setting which activates a special phaser effect that is a blend of the allpassed signal and the original input.

2. **TYPE**
   This button is used to cycle between filter types for the currently selected mode. Each filter mode has up to 5 variations with different numbers of poles, this button cycles between them. See the "MULTI Modes" section of the manual for more details.

3. **CUTOFF**
   Sets the cutoff frequency of the filter. The knob position is combined with the **FM1** and **FM2** inputs.
4. **INPUT DRIVE**
   Sets the drive, or amplification, of the input signal. Unity gain is at the 12 o'clock position. At higher settings signal will begin to experience a clipped distortion.
5. **Q**
   Sets the resonance of the filter. The knob position is combined with the **Q** input.
6. **Q Attenuator**
   Attenuator for **Q** CV input.
7. **MULTI DISTORT**
   When in the up position engages the distortion circuit on the **MULTI** output.
8. **FM1**
   Controls the amount of attenuation of the **FM1** input. The input tracks 1 V / octave when this knob is fully clockwise.
9. **FM2**
   Controls the amount and polarity of the **FM2** input. The input passes unmodified when the knob is fully clockwise, inverted when fully counter-clockwise, and has no effect when at the 12 o'clock position.

Inputs & Outputs

A. **IN**
   Audio input to the filter.
B. **Q**
   CV input for the **Q** control. The CV amount is attenuated by the black attenuator connected to the **Q** knob.
C. **FM1**
   CV input for the cutoff frequency. Attenuation is controlled by the **FM1** knob.
D. **FM2**
   CV input for the cutoff frequency. Attenuation is controlled by the **FM2** knob.
E. **LP**
   4-pole (24 dB / oct) lowpass filter output.
F. **BP**
   2-pole (12 dB / oct) bandpass filter output.
G. **HP**
   4-pole (24 dB / oct) highpass filter output.
H. **MULTI**
   Configurable filter output, configured by the **MODE** and **TYPE** buttons and processed through the distortion circuit if it is enabled.

MULTI Modes

The **MODE** and **TYPE** buttons are used to select the filtered signal available at the **MULTI** output. Pressing either button cycles through the respective options and the current selection is indicated by the illuminated LEDs. For the labels in between two LEDs, such as modes BP and N, the two LEDs surrounding the label will both be lit to indicate that it is active. Not every mode has 5 types of filters so some of the types may not be used.
The module remembers the last selected type for each mode as well as the last selected mode when it power down.

The types for each mode are arranged such that the filter slope increases with each filter type. For example LP mode A is a 1-pole lowpass, B is a 2-pole, etc.

Diagrams of the filter slopes are available in the Polaris Frequency Responses PDF.

Resonance Balance Trimmer

The side of the Polaris PCB has a resonance balance trimmer that can be used to set the balance of the self-resonating feedback of the filter with the input signal. This trimmer can be adjusted to change the sound of the filter when in self-resonance. Use a phillips head screwdriver to set the balance to taste.

The position of the trimmer is highlighted in the photograph below: