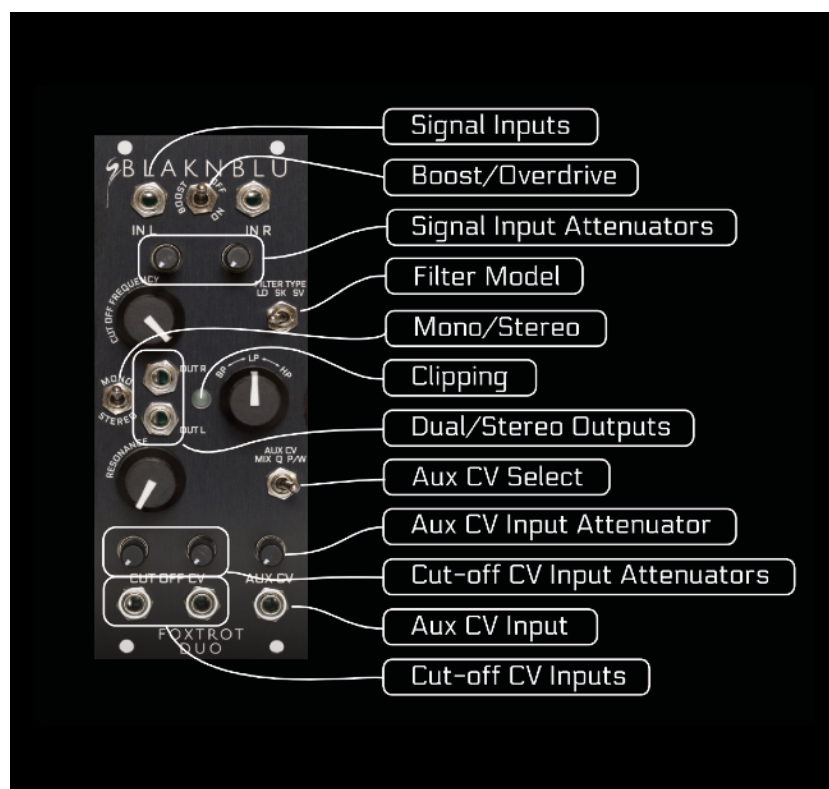




FOXTROT DUO

Foxtrot Duo User Manual

Foxtrot Duo is a multi-model, variable response Voltage Controlled Filter. It can operate in mono mode, or as a pair of linked filters for stereo signals.



1. Basic Operation

In Mono mode – set by the Mono/Stereo toggle switch, Foxtrot Duo has two mono signal inputs. The two inputs are summed together before being sent to one filter, with the attenuation of each input being set by the corresponding input trim pot.

In Stereo Mode, each of the two inputs is independent – the Right input feeding one filter and the Out R output, and the Left input feeding the second filter and the Out L output.

In either mode, all of the controls are common to both filters.

There are two cut off frequency CV inputs, each with its own attenuator control. The CVs are summed to form the CV controlling the VCFs. A CV input of 0V or below corresponds to the lowest cut-off. If you want to use a bipolar signal to modulate the VCFs (for instance, from an LFO), just turn up the manual cut off frequency knob.

The left hand cut off CV input is calibrated to track 1v per octave with the attenuator fully clockwise. The right hand cut off CV input is calibrated to 5v maximum inputs, though a higher level signal can be accommodated simply by turning down the attenuator (strictly speaking, it's turning up the attenuation, but you know what we mean. Turn it anti-clockwise!).

In Mono mode, the outputs Out R and Out L are identical. However, selecting Pan as the Aux CV input turns the two outputs into a stereo pair, with the pan now controlled by Aux CV. This Aux CV mode operates slightly differently in Stereo mode (see below).

1.1 CUT OFF FREQUENCY CONTROL

Unsurprisingly, the Cut Off Frequency knob controls the static cut off of the filter. Fully anticlockwise is the lowest frequency (around 20Hz) and fully clockwise is the highest (around 20kHz depending on the filter model).

1.2 FILTER TYPE SWITCH

Foxtrot Duo has a choice of three virtual analog filter models. Although realised digitally, these are carefully analysed models of the original circuitry from three classic filters, with all the distortions and other weird non-linearities that make them sound so great.

Setting the Filter Type switch to LD selects a Moog style 4th order ladder filter.

The SK setting selects a 2nd order 'Sallen-and-Key' filter based on the Korg 35 analog module used in early Korg synthesizers.

SV is a State Variable filter similar to the Oberheim SEM filter.

1.3 BP<-LP->HP CONTROL

Each filter type can be continuously varied from Band Pass through Low Pass to High Pass using this control, extending the capabilities of the original analog designs on which the Foxtrot filters are based.

There is a detent at the LP position so that you can be sure the response is truly just low pass. A setting half way between Low Pass and High Pass gives you a notch filter – the notch characteristics vary between the filter models, but can be used to produce interesting phasing effects, for instance.

1.4 RESONANCE CONTROL

This controls the filter Resonance – sometimes called Q, Peak, or Emphasis. At high Resonance settings, the LD and SK filters will self-oscillate. The SK filter is particularly keen!

1.5 BOOST SWITCH

The classic analog filter designs that Foxtrot models have various sources of non-linearity – in other words, bits of circuit that don't behave perfectly, introducing distortion to the audio signal. The Moog ladder filter has gentle distortion in each of its ladder 'rungs'. The Korg design actually has a diode based clipper – similar to the circuit in guitar fuzz pedals. Much of the character of the filters come from these imperfections.

Foxtrot accurately mimics these non-linearities and includes a Boost switch, to overdrive the filters for even more distortion. Note that overdriving filters tends to decrease the effect of resonance. Foxtrot compensates for this effect (to some degree) by increasing the maximum resonance when Boost is enabled. It's worth experimenting with turning Boost on, but then using the input gain pots to reduce the input level for different effects.

1.6 CLIPPING LED

With high audio input levels – particularly if you are using both inputs – and with some filter settings, it's possible for the filter to exceed the nominal Eurorack output level, so a soft-clipping circuit is included in each output. When the circuit is active, the Clipping LED illuminates. Unless you like the effect (!) you can reduce the clipping by turning down the audio inputs using the attenuator knobs.

1.6 AUX CV MODE SWITCH

The AUX CV input can be selected to control one of three filter functions.

When set to MIX the AUX CV controls the sweep from band pass to low pass to high pass. A 0V CV input corresponds to low pass, negative CVs sweep the response towards band pass, positive CVs sweep towards high pass. The BP<-LP->HP control is still active in this mode, with the CV acting as an offset to the knob setting.

When set to Q, the AUX CV controls filter resonance. Again, the CV acts as an offset to the physical Resonance control, positive CVs increasing resonance and negative CVs decreasing it.

In Mono mode, setting the AUX CV switch to P/W, turns the two filter outputs into a stereo pair, with Pan controlled by the AUX CV. A positive CV pans the signal towards the Out R output, a negative CV towards the Out L output.

In Stereo mode, the P/W setting allows the AUX CV to control the cut off frequency offset between the two filters. A positive CV raises the cut off frequency of the right filter and lowers the cut off of the left filter. Unsurprisingly a negative CV has the opposite effect, lowering the right filter cut off and raising the left, giving a frequency based pan.

Specifications

Width: 10HP

POWER CONSUMPTION

+12v: 200mA

-12v: 50mA

+5v: 0mA

Inputs:

Signal (Zero attenuation): $\pm 5\text{v}$ nominal, $\pm 12\text{v}$ max

Cut Off CV Left (Zero attenuation): Volt per Octave

Cut Off CV Right (Zero attenuation): $\pm 5\text{v}$ nominal

Aux CV (Zero attenuation): $\pm 5\text{v}$ nominal

Outputs:

Dual/Stereo: $\pm 12\text{v}$

Important Safety Instructions

Correct disposal of this product:



This symbol indicates that this product must not be disposed of with household waste according to WEEE Directive (2012/19/EU) and your national law. This product should be taken to a collection centre licensed for the recycling of waste electrical and electronic equipment (EEE).