

1. Introduction

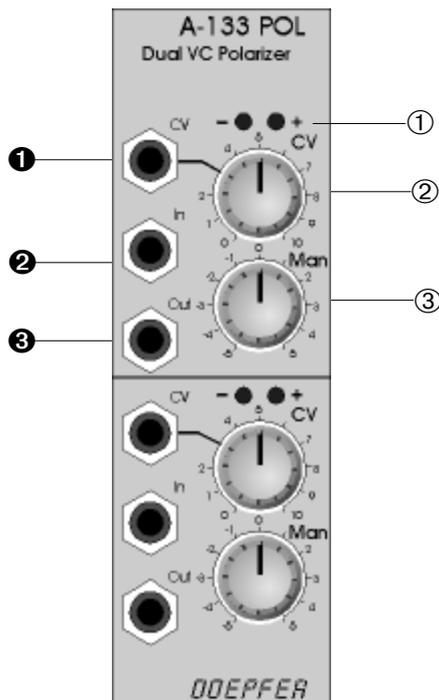
Module A-133 (**Dual VC Polarizer**) is a **special dual voltage controlled amplifier** that enables both **positive** and **negative amplifications**. Negative amplification means in this context that the signal is **inverted**.

The main application of the module is the **processing of control voltages**, e.g. ADSR or LFO. But even **audio signals** can be processed with this module.

The **amplification range** is about $-2.5 \dots 0 \dots +2.5$. Amplification can be adjusted **manually** (Man control) or by an **external control voltage**.

The present **amplification** is **displayed** with **two LEDs**: one for positive and one for negative amplifications.

2. Overview



Controls and indicators:

- ① **LEDs :** negative/positive amplification display (not a signal display !)
- ② **CV :** attenuator for the control voltage at input ① that controls the amplification
- ③ **Man. :** manual amplification control

In- / Outputs:

- ① **CV :** control voltage input
- ② **In :** signal input
- ③ **Out :** signal output

3. Controls and Indicators

① LEDs

The two LEDs **indicate the amplification** of the polarizer in question (**attention:** in contrast to the LED displays of other modules they do not show the signal but the amplification factor !).

Tab. 1 shows the connection between LED display and amplification. At maximum negative amplification (about -2.5, signal inverted !) the left LED lights with maximum brightness. At maximum positive amplification (about +2.5, signal not inverted!) the right LED lights with maximum brightness. With amplification about zero (i.e. no output signal) both LEDs are off.

② CV

The attenuator ② is used to adjust the **effect of the external control voltage** on the amplification.

③ Man.

This control is used to adjust the **amplification manually**. The range is about **-2.5 to +2.5** (without external control voltage). The middle position corresponds to about zero amplification (but in any case the LEDs should be used to find out the current amplification).

Man.	LEDs	a	In	Out
-5		-2,5		
-2		-1		
0		0		
2		1		
5		2.5		

Tab. 1: Connection between manual control (Man.) , LED display, amplification (a) and effect on the output signal



It is possible to obtain other amplification ranges (e.g. -1 ...+1 or -5 ...+5). For this a resistor has to be replaced. Please look at the A-100 service manual or contact hardware@doepfer.de. We think that -2.5...+2.5 is a good compromise as higher amplification

ons would cause clipping for all standard A-100 signals (like LFOs, ADSRs or VCOs).

If the **amplification is negative** the signal is inverted (see table above).

The effects of the manual control ③ and the external control voltage ① with attenuator ② are added up.

4. In- / Outputs

① CV

This jack socket is the **control voltage input** to control the amplification by an external control signal.

② In

The signal to be amplified/inverted (control voltage or audio) is fed into this **signal input socket ②**.

③ Out

Socket ③ is the **signal output**.

5. User examples

One application is the **generation of new waveforms**. For this two VCO outputs are connected to the signal and the control input of the A-133 (see fig.1).

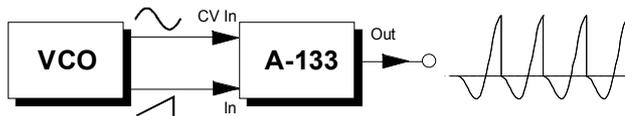


Fig. 1: Generating new waveforms

Same applies for **modulations** (see fig. 2). Instead of LFOs even ADSRs or other CV sources can be used.

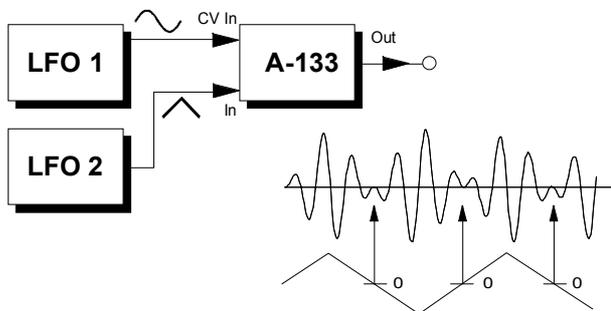


Fig. 2: Control voltage modulation, arrows indicate polarity changes

Additional examples:

- voltage controlled feedback of filters (e.g. A-108), phaser (A-101-3) or spring reverb (A-199)
- polarity change of envelope signals (frequency CV is used to control both filter frequency and polarizer amplification simultaneously)