

b:art instruments

b:alance

Quad Analog VCA/Attenuverter



User Manual

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Introduction

b:alance is a quad attenuverter and VCA module with integrated mixing and advanced normalization. Designed for both audio and CV processing, it offers:

- Four precision attenuverters (AVs) for detailed signal shaping.
- Four high-fidelity DC-coupled VCAs, each with gain control and CV modulation.
- Flexible signal routing, allowing seamless interaction between channels.
- High-end analog components, ensuring clean, low-noise operation with precise control.

Safety Information

Ensure your modular system is powered off before installing the module. Only power on the system once every module is connected and properly installed in your system using the provided screws.

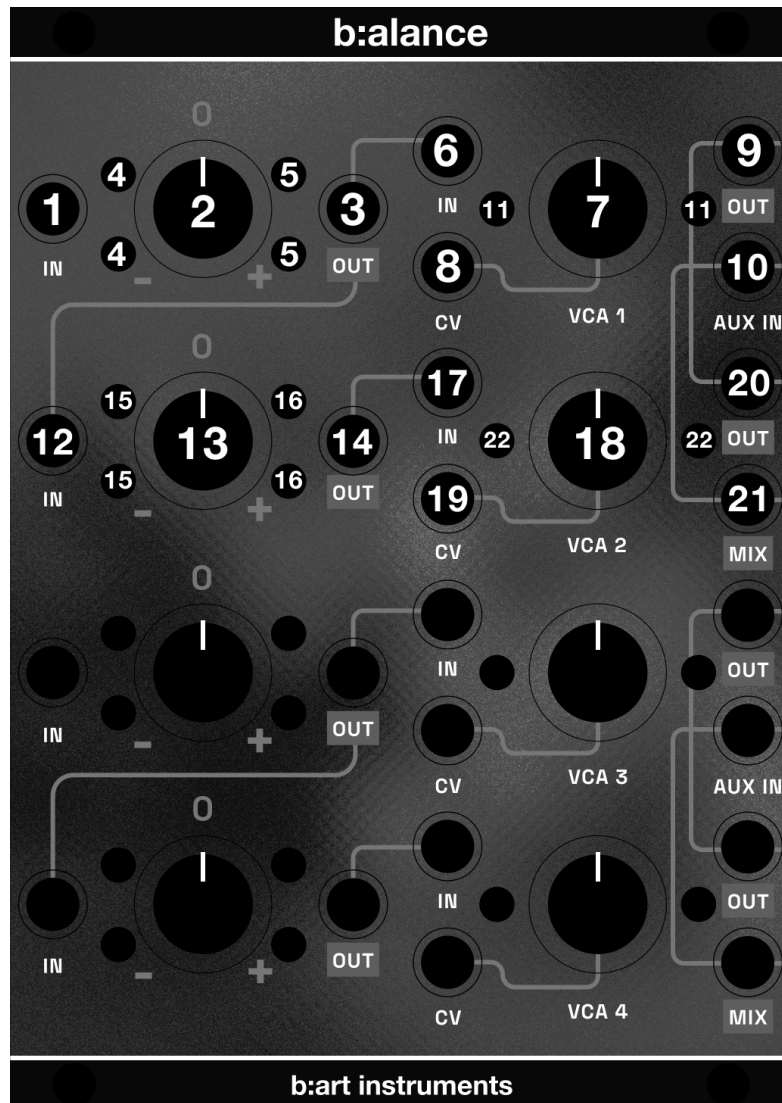
The module uses shrouded headers to minimise the risk of failure due to incorrect power cable orientation, however caution must be exercised to avoid plugging the power cable backwards into the power supply, depending on the model.

Do not expose the module to moisture or extreme temperatures.

Do not operate the module in environments with severe amount of dust in the air.

The module's inputs are protected against electrostatic discharge, but be careful when handling the module itself.

Module overview



- | | | |
|--------------------------------|---------------------------------|---------------------------------|
| 1 Attenuverter 1 Input | 8 VCA 1 Gain CV | 15 Input Indicator LEDs |
| 2 Attenuverter 1 Knob | 9 VCA 1 Output | 16 Output Indicator LEDs |
| 3 Attenuverter 1 Output | 10 Auxiliary Mix Input | 17 VCA 2 Input |
| 4 Input Indicator LEDs | 11 Gain Indicator LEDs | 18 VCA 2 Gain Knob |
| 5 Output Indicator LEDs | 12 Attenuverter 2 Input | 19 VCA 2 Gain CV |
| 6 VCA 1 Input | 13 Attenuverter 2 Knob | 20 VCA 2 Output |
| 7 VCA 1 Gain Knob | 14 Attenuverter 2 Output | 21 VCA 1+2+Aux Output |
| | | 22 Gain Indicator LEDs |

Controls & I/O

Attenuverter Section

Each attenuverter allows bidirectional signal scaling, offering both positive and negative gain. AV 1 features:

- Input – Accepts audio or CV signals.
- Input Level Indicator LEDs – Visual feedback of incoming signal.
- Attenuverter Knob – Ranges from -100% to 100% (center at 0).
- Output Level Indicator LEDs – Displays processed signal amplitude.
- Output – Outputs the processed signal.

AVs 2-4 are identical to AV 1, with AV 2 normalled to AV 1 input, and AV 4 normalled to AV 3 input. The normalisation is also highlighted on b:alance's front panel, making it easy to see at a glance.

Voltage-Controlled Amplifier Section (VCA 1-4)

Each VCA provides precision gain control and is DC-coupled, making it ideal for both audio and CV modulation. VCA 1 & 2 features:

- Input – Accepts audio or CV (normalled to the corresponding AV output).
- Gain Knob – Manual gain adjustment.
- Gain CV Input – External control over gain (normalled across all other VCAs; inserting a new CV source breaks the chain).
- Gain Level Indicator LEDs – Visual feedback of gain modulation.
- Output – Processed VCA signal output.
- Aux Input – Additional signal input for summing.
- Mix Output – Summed output of VCA 1, VCA 2, and Aux Input.

VCA 3 & 4's I/O is identical to VCA 1 & 2, with a separate mix output.

Calibration & Maintenance

The module is factory calibrated for optimal performance. If needed, the Attenuverter potentiometers can be tested and recalibrated by turning their respective trimmer potentiometers at the back of the module. Keep all jacks and potentiometers clean of debris to ensure smooth operation.

Technical Specifications

Operating voltages:	-12V / +12V
Power draw:	78 mA -12V / 75 mA +12V
Width:	18HP
Depth:	17mm (22mm with power header)
CV input levels:	0 – 5V
Audio inputs & outputs level:	10Vp-p (-5V/+5V)
Output impedance:	1000ohm (all outputs)



This product was tested and found compliant with the following standards:
EN 55032:2015/A11:2020, EN 55035:2017, EN IEC 63000:2018.
For details, please visit: <https://www.bartinstruments.com/conformity>