Behringer ABACUS

Behringer ABACUS Analog Music Computer Module
User Manual

1. INTRODUCTION

The Behringer ABACUS is a versatile Analog Music Computer Module designed for Eurorack modular synthesizer systems. It functions as a multi-purpose utility module capable of generating envelopes, acting as a low-frequency oscillator (LFO), performing signal mixing, and executing logic operations. Its design allows for a variety of linear, logarithmic, and exponential triggered or continuous functions, enabling the creation of complex musical events such as ramping up or down in tempo.

This manual provides detailed instructions for the setup, operation, and maintenance of your ABACUS module, ensuring you can fully utilize its capabilities within your Eurorack setup.

Figure 1: Front panel of the Behringer ABACUS module, showcasing its inputs, outputs, and controls.

2. SAFETY INSTRUCTIONS

- Always ensure your Eurorack power supply is turned off before installing or removing the ABACUS module.
- Connect the power cable correctly, aligning the red stripe on the cable with the -12V pin on both the module and the Eurorack bus board. Incorrect connection can damage the module and/or power supply.

- Do not expose the module to moisture or extreme temperatures.
- Avoid dropping the module or subjecting it to severe impacts.
- Refer all servicing to qualified personnel. There are no user-serviceable parts inside.

3. SETUP

3.1 Eurorack Installation

1. Turn off and disconnect your Eurorack case from the main power supply.
2. Locate an available space in your Eurorack case that accommodates the module's width (16 HP).
3. Connect the included ribbon cable to the 16-pin header on the back of the ABACUS module. Ensure the red stripe on the cable aligns with the -12V marking on the module's PCB.
4. Connect the other end of the ribbon cable to an available 16-pin header on your Eurorack bus board, again ensuring the red stripe aligns with the -12V pin.
5. Carefully place the module into the desired position in your Eurorack case.
6. Secure the module using the provided mounting screws. Do not overtighten.
7. Once installed, reconnect your Eurorack case to the main power supply and turn it on. The LED indicators on the ABACUS module should illuminate, indicating proper power.

Figure 2: Angled view of the ABACUS module, illustrating its compact form factor and potential for integration into a Eurorack system.

4. Controls and Features

The ABACUS module features two identical function generator sections, along with a utility section for signal processing. Each function generator can operate independently or in conjunction with the other.

Figure 3: Detailed view of the ABACUS module's control surface.

4.1 Function Generator Sections (Left and Right)

- **IN 1** / **IN 4 (Inputs):** Signal inputs for processing.
- **TRIG 1** / **TRIG 4 (Trigger Inputs):** Inputs for external trigger signals to initiate the function generator's cycle.
- **RISE (Knob):** Controls the time it takes for the output signal to rise from its minimum to maximum value.
- **FALL (Knob):** Controls the time it takes for the output signal to fall from its maximum to minimum value.
- **BOTH (Input):** An input that allows for simultaneous control over both RISE and FALL parameters.
- **LIN** / **LOG** / **EXP (Switch/Knob):** Selects the curve shape of the rise and fall segments. Options include Linear, Logarithmic, and Exponential. This control allows for fine-tuning the dynamic response of the generated function.
- **CYCLE (Button/LED):** Toggles the function generator between one-shot (envelope) and continuous (LFO) modes. When active, the LED illuminates, and the module will continuously cycle through its rise and fall phases.
- **OUT 1** / **OUT 4 (Outputs):** Main voltage outputs of the function generators.
- **EOR (End of Rise Output):** Provides a trigger or gate signal when the RISE phase of the function generator is completed.
- **EOC (End of Cycle Output):** Provides a trigger or gate signal when the entire cycle (Rise and Fall) of the function generator is completed.

4.2 Utility Section (Center)

- **IN 2** / **IN 3 (Inputs):** Additional signal inputs, often used for the utility functions.
- **OR (Output):** Provides the logical OR of input signals. If any input is high, the output is high.
- **SUM (Output):** Provides the sum of input signals, acting as a voltage mixer.
- **INV (Output):** Provides an inverted version of an input signal.
- **Attenuverters (Knobs 1-4):** These small knobs located above the central outputs (OUT 1-4) and below IN 2/IN 3 act as attenuverters, allowing you to scale and invert incoming signals.

5. Operation

The ABACUS module's flexibility allows for numerous applications within a modular system. Here are some common operational modes:

5.1 Envelope Generator

- Connect a gate or trigger signal to the **TRIG** input.
- Adjust the **RISE** and **FALL** knobs to shape the attack and decay times of your envelope.

- Use the **LIN/LOG/EXP** control to select the desired curve for the envelope's segments.
- Ensure the **CYCLE** button is disengaged (LED off) for one-shot envelope generation.
- Patch the **OUT** to a VCA (Voltage Controlled Amplifier) or VCF (Voltage Controlled Filter) to modulate amplitude or timbre.

5.2 Low-Frequency Oscillator (LFO)

- Engage the **CYCLE** button (LED on) to set the function generator to continuous cycling mode.
- Adjust the **RISE** and **FALL** knobs to control the speed and shape of the LFO waveform.
- Experiment with the **LIN/LOG/EXP** control to create different LFO shapes (e.g., ramp up, ramp down, triangle, exponential curves).
- Patch the **OUT** to modulate parameters like oscillator pitch, filter cutoff, or panning.

5.3 Mixer / Attenuverter

- Use the central **SUM** output to mix multiple incoming control voltages (CVs) or audio signals. Patch signals into **IN 1, IN 2, IN 3, IN 4**.
- The small attenuverter knobs allow you to scale and invert the signals before they are summed or sent to their respective outputs.

5.4 Logic Functions

- The **OR** output can be used to combine gate or trigger signals. If any input to the OR section is high, the OR output will be high.
- The **INV** output provides an inverted version of an input signal, useful for creating complementary control voltages.

6. MAINTENANCE

The Behringer ABACUS module requires minimal maintenance. Follow these guidelines to ensure its longevity:

- **Cleaning:** Use a soft, dry cloth to wipe the module's surface. Do not use abrasive cleaners, solvents, or waxes, as these can damage the finish and controls.
- **Environment:** Keep the module in a dry environment, away from direct sunlight, excessive dust, and extreme temperatures.
- **Handling:** Always handle the module by its edges when installing or removing it from your Eurorack case. Avoid touching the PCB components on the rear.

7. TROUBLESHOOTING

If you encounter issues with your ABACUS module, try the following troubleshooting steps:

- **No Power/LEDs Off:**
  - Ensure your Eurorack case is powered on.
  - Check the ribbon cable connection on both the module and the bus board. Verify the red stripe is correctly aligned with the -12V pin on both ends.
  - Try connecting the module to a different power header on your bus board.

- **No Output Signal:**
  - Verify that input signals (TRIG, IN) are correctly patched and active.
  - Check the **RISE** and **FALL** knob settings; if set to minimum, the function may be too fast to perceive.
  - Ensure the **CYCLE** button is set appropriately for your desired operation (on for LFO, off for one-shot

envelope).

- Test the output with a known working patch cable and destination module.

- **Unexpected Behavior:**

  - Review your patch cables for correct connections.
  - Ensure no unintended signals are patched into inputs.
  - Check the **LIN**/**LOG**/**EXP** setting, as this significantly alters the function's shape.

If problems persist after attempting these steps, please contact Behringer customer support or refer to the official Behringer website for further assistance.

8. SPECIFICATIONS

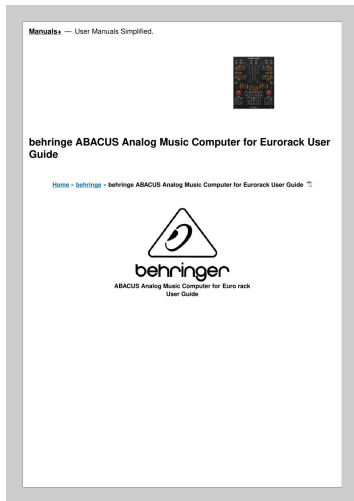| Feature	Specification
Model Name	ABACUS
Product Dimensions	0.94"D (Depth)
Item Weight	10.6 ounces (approx. 300 grams)
Color	Black
Power Source	DC power supply (Eurorack standard)
Connectivity Technology	USB (for potential future firmware updates, not for primary operation)
Manufacturer	Behringer
UPC	644216649303
ASIN	B0C4HT9QTQ

9. WARRANTY AND SUPPORT

For detailed information regarding the warranty policy for your Behringer ABACUS module, please refer to the official Behringer website or the warranty card included with your product. Behringer provides comprehensive support for its products.

If you require technical assistance, have questions about your module, or need to arrange for service, please visit the Behringer support page on their official website. You will find FAQs, driver downloads, and contact information for customer service.
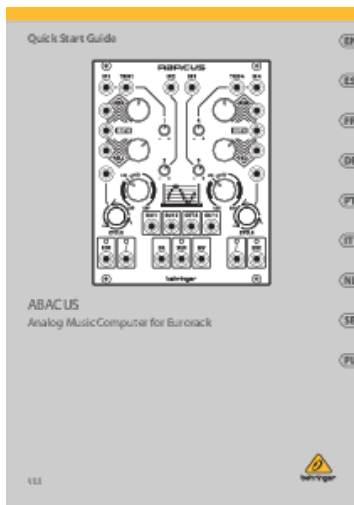
Official Behringer Website: www.behringer.com

Documents - Behringer – ABACUS

behringe ABACUS Analog Music Computer for Eurorack User Guide

ABACUS Analog Music Computer for Euro rack
User Guide

[Behringer ABACUS Analog Music Computer for Eurorack User Guide](#)
User guide for the Behringer ABACUS Analog Music Computer for Eurorack, detailing its features, controls, power connection, installation, specifications, and important information.
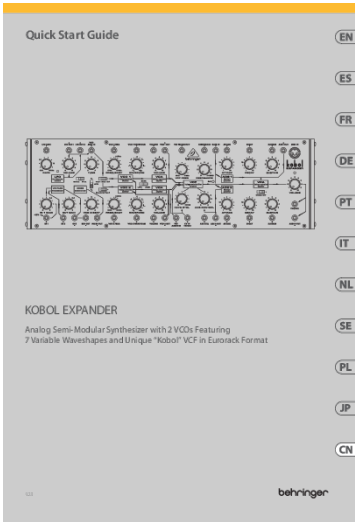lang:en score:40 filesize: 445.99 K page_count: 10 document date: 2023-05-26

Quick Start Guide

EN ES FR DE PT IT NL SE PL

ABACUS
Analog MusicComputer for Eurorack

[Behringer Abacus Analog Music Computer for Eurorack Quick Start Guide](#)
This document provides a quick start guide for the Behringer Abacus Analog Music Computer for Eurorack, detailing its controls, functions, and safety instructions.
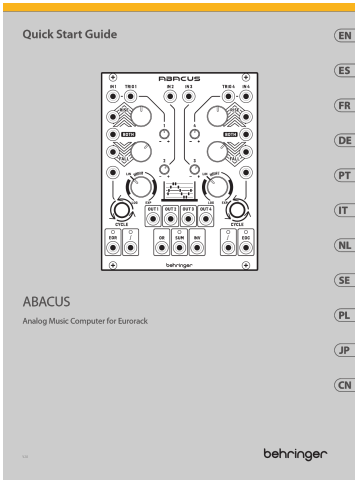lang:en score:34 filesize: 713.56 K page_count: 37 document date: 2022-10-14

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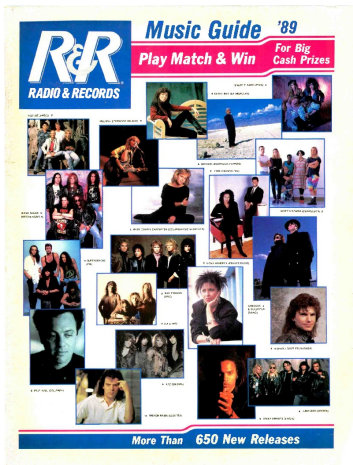lang:en score:23 filesize: 3.96 M page_count: 38 document date: 2023-12-21

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Quick Start Guide **ABACUS** Analog Music Computer for Eurorack V 2.0 2 **ABACUS** EN Safety Instruction 1. Please read and follow all instructions. 2. Keep the apparatus away from water, except for outdoor products. 3. Clean only with a dry cloth. 4. Do not block any ventilation openings. Install in a...
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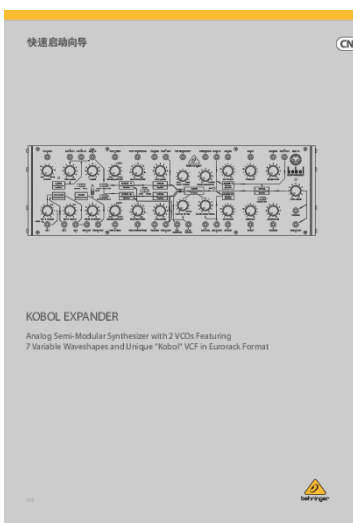lang:en score:17 filesize: 13.1 M page_count: 90 document date: 2018-02-16

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