VERMONA

ELEKTROAKUSTISCHE MANUFAKTUR

twinCussion

User Guide

Foreword

Analog drum synthesizers are simply unbeatable! No matter how many thousand drum sounds your sample library offers, it will never replace the charm and character of real analog drums. These sounds are alive and constantly changing. They can be adjusted right on the spot and modulated in real time.

twinCussion holds all these qualities. Instead of focusing on a certain sound, twinCussion offers a whole spectrum of sounds. Easily create solid analog drums such as bass drums, snares, hi-hats as well as FM-percussions, metal-FX or wobble kicks. By using the numerous patch connections, sounds can be massively expanded and rhythmically modulated. Thanks to its dual structure, twinCussion can generate two sounds simultaneously.

Finally, as always, VERMONA guarantees for quality, musicality and fun.

Your VERMONA crew from the
Elektroakustischen Manufaktur, Erlbach

Unpacking and scope of delivery

To ensure top quality we carefully checked the twinCussion module before packaging. Nevertheless, we cannot fully exclude damage during transportation. Therefore, we kindly ask you to inspect twinCussion by yourself, once you receive the module. In case there is anything unusual about the unit or its packaging, do not hesitate to contact us, so that we can take care of the problem.

You should find the following items in the box:

- the twinCussion module
- a ribbon-cable (10-pole to 16-pole)
- four screws 3 x 6 mm with matching plastic washers
- this user guide

Installation, setup and powering

twinCussion was designed to work in modular synthesizer systems using the common eurorack format. Its power supply, connectors and dimensions match the typical specifications (VERMONA Modular Case 104, Doepfer A-100 and compatible systems). Installation is carried out just like for any module:

1. **Switch off the power supply!** For safety reasons, also remove the detachable power cable from your frame before mounting the module! (See "Figure 1: twinCussion rear with connector" on page 5).

2. Connect the supplied ribbon-cable with its 10-pole connector to the corresponding multi-pin connector on twinCussion's rear.

⚠ **The corresponding plug socket is protected against reverse polarity. Therefore, the 10-pole connector will only fit in one direction into the module. The supplied ribbon-cable is color-coded at the -12 volts position. Note, that this may differ from other manufacturers. Therefore, only use the supplied ribbon-cable to connect twinCussion to your frame's system bus!**

3. Connect the ribbon-cable's 16-pole connector to an empty plug-socket of your frame's system bus. **Make sure the color-coded side of the cable points towards -12 volts!**

⚠ **Connecting the ribbon-cable with reverse polarity can lead to damage of twinCussion or other modules when powering the system! Double check the connections before continuing – safe is safe!**

4. Mount twinCussion to your modular frame using the supplied screws. To protect the unit's surface from scratches, use the supplied flat plastic washers.

5. Reconnect the power cable to your frame and switch on the power-supply. twinCussion is now ready to operate.

The following chapters will explain how to use the module's different connectors and how to use these in a modular system.
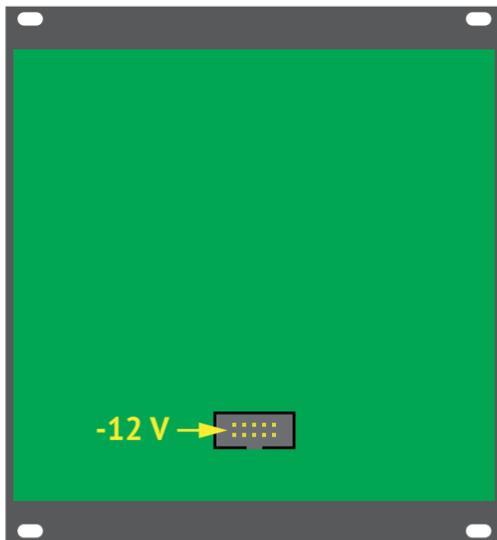
Figure 1: twinCussion rear with connector

twinCussion – Overview and functions

twinCussion is a sound engine specialized in the creation of drum- and percussion sounds. In doing so, twinCussion is not limited to specific instruments such as bass drums, snares or hi-hats. Instead, thanks to it universal structure, it covers a huge scope of different percussive instruments and effect-sounds.

Available are two sections (A and B) that can be used independently or be combined for more complex sounds. The internal structure allows easy creation of sounds with direct access to the sound shaping elements. By using the patch-connections of the module, this structure can be changed in multiple ways. In connection with additional modules, such as VCAs, filters, sequencers or LFOs, the possibilities of twinCussion can be expanded endlessly.

Sections A and B are designed similarly: The signal of an oscillator (VCO), which can be modulated in pitch, is send into a voltage controlled amplifier (VCA). Each section offers an envelope generator (EG) for modulations.

The VCOs offer a very wide frequency range allowing to easily create punchy bass drums and toms as well as compact snares, metallic percussions and clanking hi-hats. The envelopes work extremely fast while simultaneously offering fine resolution at lower values. An essential quality, being necessary to precisely create and adjust firm percussion sounds.

☞ **The oscillators of twinCussion are especially designed for percussive sounds and doesn't follow the 1 V/octave standard.**

The following section will explain the specifics and control elements of both sections A and B in detail.
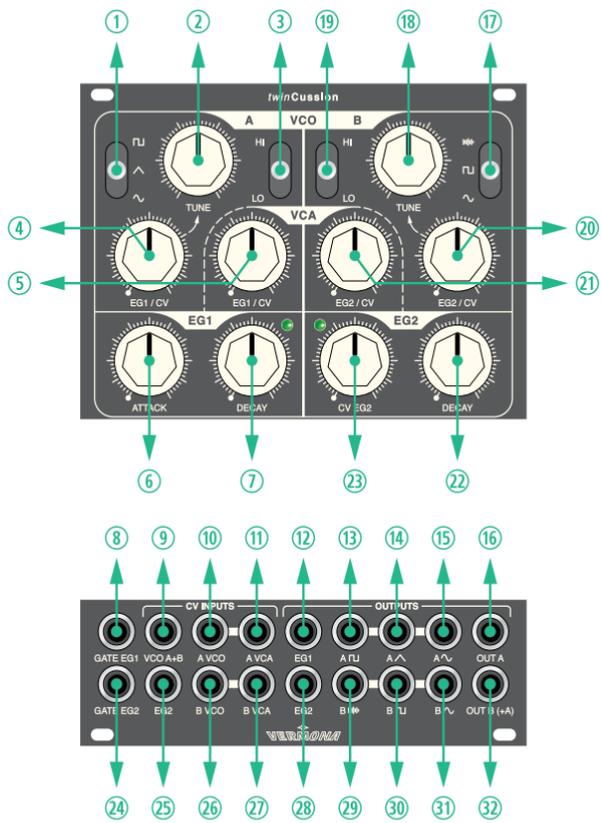
Figure 2: twinCussion control elements and connections

Section A

The oscillator (VCO)

Waveform selector ①
This selects the waveform for the oscillator, which is then passed on to the corresponding voltage controlled amplifier (VCA). Available are rectangle (⊓) , triangle (∧) and sine (∿).

Waveform outputs ⑬, ⑭ and ⑮
These connectors output all three waveforms ⊓, ∧ and ∿ of VCO A in parallel and independently of the waveform selector's setting ①.

TUNE control ② and HI/LO selector ③
TUNE ② continuously adjusts the oscillator's pitch within the selected frequency range, set by the HI/LO selector switch ③.

HI/LO selector switch	Control range for TUNE
LO	20 Hz (fully counterclockwise) up to 200 Hz (fully clockwise)
HI	100 Hz (fully counterclockwise) up to 3 kHz (fully clockwise)

VCO A+B input socket ⑨
In addition to the value being set by **TUNE** ② and HI/LO ③, the oscillator's pitch can also be manipulated by control voltages being applied to input **VCO A+B** ⑨. By this, the maxima mentioned for **TUNE** ② in the chart above can be increased to 380 Hz (**LO**) respectively 5.6 kHz (**HI**).

The control voltage being applied to input **VCO A+B** ⑨ affects the pitch of both VCOs simultaneously.

EG1 / CV control ④ and A VCO input socket ⑩

The control **EG1 / CV** ④ adjusts the intensity of the pitch modulation by envelope generator EG1 or a control voltage being applied to input **A VCO** ⑩.

Envelope generator EG1 is internally pre-wired as modulator to VCO A. The internal pre-wiring is disconnected when using connector **A VCO** ⑩. In this case, the control voltage being inserted here, will be used as modulation source instead.

The voltage controlled amplifier (VCA)

EG1 / CV control ⑤ and A VCA input socket ⑪

The control **EG1 / CV** ⑤ adjusts the modulation intensity of the VCA by envelope generator EG1 or by a control voltage being applied to input **A VCA** ⑪. Therefore, it acts comparable to a volume control for section A.

Envelope generator EG1 is internally pre-wired as modulator to the VCA. The internal pre-wiring is disconnected when using the connector **A VCA** ⑪. In this case, the control voltage being inserted here, will be used as the modulation source instead.

OUT A output socket ⑯

This outputs the audio signal of section A.

The envelope generator (EG1)

GATE EG1 input socket ⑧

A trigger- or gate-signal being applied here, triggers envelope EG1. The green LED located right of the **DECAY** control ⑦ visualizes the envelope generator's progress by its brightness.

☞　　　**The signal being applied to input GATE EG1 ⑧ is normalized to EG2 as long as input GATE EG2 ㉔ is not being used. Thus, both envelope generators can easily be triggered by the same signal.**

ATTACK ⑥ and DECAY ⑦

The **ATTACK** ⑥ and **DECAY** ⑦ controls are used to adjust the rise- and decay times of the envelope generator. The envelope generator has been specifically optimized in time and characteristic to control percussive signals.

The rise time for **ATTACK** ⑥ can be adjusted from ultrafast 0.1 ms up to 2 s. The first half of the control range only adjusts a tiny range that is nevertheless extremely important for percussive sounds. Even at the 12 o' clock setting, the rise time is still very fast (about 5 ms).

The decay time **DECAY** ⑦ can be adjusted between 0.5 ms and 5 s.

EG1 output socket ⑫

Output **EG1** ⑫ allows tapping the envelope signal of EG1 to be used with other parameters or other modules.

Section B

The oscillator (VCO)

Waveform selector ⑰

This selects the waveform for the oscillator, which is then passed on to the corresponding voltage controlled amplifier (VCA). Available are rectangle (⊓) and sine (∿).

In addition to the oscillator, section B offers a noise generator that can also be activated from the waveform selector (⊪).

Noise generator and waveform outputs ㉙, ㉚ and ㉛

These connectors output the noise generator ⊪ as well as the waveforms ⊓ and ∿ in parallel and independently of the waveform selector's ⑰ setting.

TUNE control ⑱ and HI/LO selector ⑲

TUNE ⑱ continuously sets the oscillator's pitch within the selected frequency range, set by the HI/LO selector switch ⑲.

HI/LO selector switch	Control range for TUNE
LO	20 Hz (fully counterclockwise) up to 200 Hz (fully clockwise)
HI	100 Hz (fully counterclockwise) up to 3 kHz (fully clockwise)

At the same time, **TUNE** ⑱ adjusts the frequency of an internal filter that shapes the noise generator. The further the control is turned left, the deeper and fuller the sound of the noise generator. Turning clockwise will gradually cut lower frequencies.

The setting of the HI/LO selector switch ⑲ also influences the sonic character of the filter. In its **LO** position, the noise generator will sound darker while the **HI** position will emphasize higher frequencies.

VCO A+B input socket ⑨
As described in section A, the oscillator's pitch can additionally be manipulated by a control voltage being applied to input **VCO A+B** ⑨. The effect on VCO B is identical to VCO A.

This control voltage does not affect the noise generator's filter frequency.

EG2 / CV control ⑳ and B VCO input socket ㉖
The control **EG2 / CV** ⑳ adjusts the intensity of the pitch modulation by envelope generator EG2 or a control voltage being applied to input **B VCO** ㉖.

Envelope generator EG2 is internally pre-wired as modulator to VCO B. The internal pre-wiring is disconnected when using input **B VCO** ㉖. In this case, the control voltage being inserted here, will be used as modulation source instead.

Control voltages respectively EG2 do not affect the noise generator's filter frequency.

The voltage controlled amplifier (VCA)

EG2 / CV control ㉑ and B VCA input socket ㉗
The control **EG2 / CV** ㉑ adjusts the intensity of VCA B's modulation by envelope generator EG2 or by a control voltage being applied to input **B VCA** ㉗. The control acts similar to a volume control for section B.

Envelope generator EG2 is internally pre-wired as modulator to the VCA. The internal pre-wiring is disconnected when using connector **B VCA** ㉗. In this case, the control voltage being inserted here, will be used as modulation source instead.

OUT B (+A) output socket ㉜

This outputs the audio signal of section B.

In case output **OUT A** ⑯ is not being used, this connector will output a mixed signal of sections A and B.

The envelope generator (EG2)

GATE EG2 input socket ㉔

A trigger- or gate-signal being applied here, triggers envelope EG2. The green LED located left of the control **CV EG2** ㉓ visualizes the envelope generator's progress by its brightness.

DECAY control ㉒

By using the **DECAY** control ㉒, the decay time of envelope generator EG2 is manually adjusted within a range between 0.5 ms and 10 s. The envelope generator has been specifically optimized in time and characteristic to control percussive signals.

CV EG2 control ㉓ and EG2 input socket ㉕

The decay time of envelope generator EG2 can additionally be modulated by an external control voltage applied to input **EG2** ㉕. The modulation intensity is then adjusted by the **CV EG2** control ㉓.

EG2 ouput socket (28)

Output **EG2** allows tapping the envelope signal of EG2 to be used with other parameters or other modules.

Technical Specification

Levels	
EG1/EG2 trigger threshold	+2 V
EG1/EG2 output levels	+5 V
max. CV input levels	± 5 V
max. output levels VCO A/VCO B	< 7.5 V_{SS}
max. output level noise generator	< 7.5 V_{SS}
Maximum Power Consumption	
+12 V	105 mA
-12 V	70 mA
+5 V	-
Dimensions / Weight	
Width / Height	24 HP (121.5 mm) / 3 U
Depth	45 mm
Weight	380 g

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