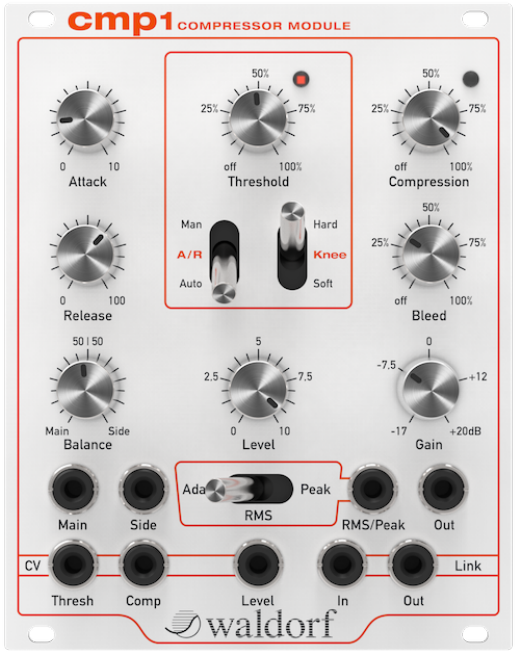
WALDORF CMP1 USER MANUAL

Waldorf Music GmbH

2016-11-15



Introduction

Thank you for purchasing the cmp1 Compressor Eurorack module.

Like any Waldorf product, the cmp1 has been developed and produced using vegetables from organic farming. We hope you enjoy it as much as we do.

Reading this user manual, you will discover all the device's features, learn its basic operation, and benefit from tips & tricks we discovered during product development.

Your Waldorf Team

Disclaimer

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For additional information / sound demos / software downloads, please visit our website:

http://www.waldorf-music.info

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	Revision: 1.0, 2016-11-15

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Contents

1 General Safety Guidelines

Please read the following safety guidelines carefully!
They include precautions you should always observe when dealing with electronic equipment.

- Only use the device indoors in a dry atmosphere.
- Never use the device in damp conditions, such as in bathrooms or near swimming pools.
- Do not use the device in extremely dusty or dirty environments in order to preserve the device's surface finish.
- Ensure that adequate ventilation is available for the device to cool down. Do not place the device near heat sources, such as radiators.
- Do not expose the device to extreme vibrations.
- Unplug the device when not in use for longer periods.
- Never place objects containing liquids on top of or near the device.
- Ensure that no foreign objects find their way into the unit. If this occurs, switch the power off, unplug the device and consult an authorised repair centre.

When used with amplifiers, speakers or headphones, this device can generate volume levels that may result in **irreparable damage to human hearing,** so volume should be kept at moderate levels at all times.

This device is **designed exclusively** to generate low frequency audio signals for sound generation. Any other use is prohibited and voids the warranty extended by **Waldorf Music GmbH**. Damages due to incorrect use are not the responsability of **Waldorf Music GmbH**.

2 Device Maintenance

- Do not try to open the device or detach the frontpanel.
- Refer all service and repair tasks to qualified personnel.
- There are no user serviceable parts inside the chassis.
- Use only a soft cloth or brush to clean the device surface.
- **Never use cleaning chemicals** as they will damage the device surface.

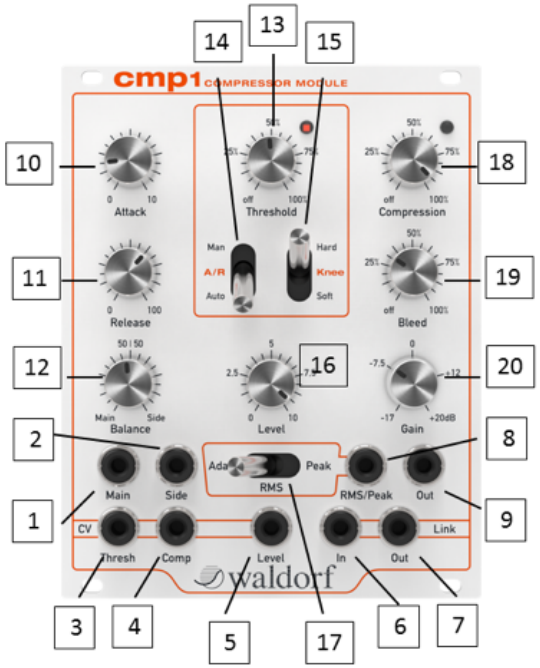
3 Package Contents

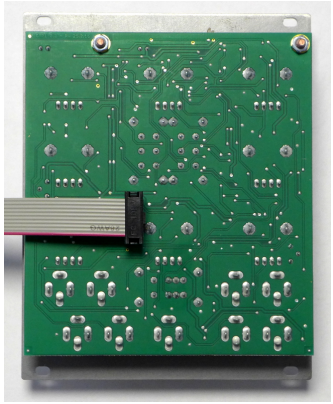
The cmp1 package contains the following parts:

- cmp1 Compressor Module
- 1 x 10-way 20cm ribbon cable
- 4 x M2.5 x 6 screws
- 4 x M3 washers
- German protective atmosphere

Only a Phillips head screwdriver #0 is needed to mount the module into your modular rack. No additional tools are needed.

4 Connectors & Controls





4.1 Connectors

No	Id	Description
1	Main Audio Input	Used to feed with audio material (Loops, Basses, Guitar, etc. . .)
2	Side Audio Input	Used for the classical side chain compression
3	Thresh CV Input	Used to control the compressor threshold
4	Comp CV Input	Used to control the compression ratio
5	Level Input	Used to control the signal level by a Control Voltage (Classic VCA instead of compression mode)
6	Link Input	Used for chaining several cmp1 modules for multi-channel compression
7	Link Output	Used for providing the master compressor signal to a chained cmp1
8	RMS Peak Output	Output to be used as a CV modulation source for other modules
9	Main Out	Audio Signal Main Output

4.2 Controls

No	Id	Description
10	Attack Knob	Used for controlling the attack time of the compression
11	Release Knob	Used to control the release time
12	Main/Side Balance Knob	Balancing the main input signal vs the sidechain signal
13	Threshold Knob	Used to control the engage level of compression threshold
14	A/R Man/Auto Switch	Used to choose between two different attack/release timing behaviours
15	Knee Hard/Soft Switch	Used to change between soft and hard compression behaviour
16	Level Knob	Controls the amount of the CV Level Input signal in case of use as a VCA
17	Compression Type Switch	Chooses between three signal detection types (Adapt, RMS and Peak)
18	Compression Knob	Controls the amount of compression
19	Bleed Knob	Controls the amount of the original uncompressed signal to the output mix
20	Gain Knob	Controls the overall gain of the processed signal

5 Device Connection

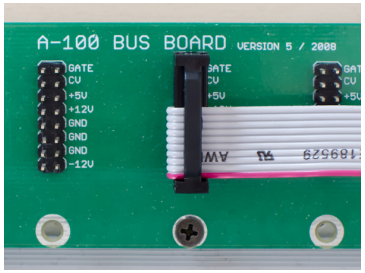
You now own a fantastic compressor module. It's time to integrate it in your modular system.

5.1 Power Connection

The first step is to supply your module with power. The module only requires regulated +12V and -12V voltages. These voltages should already be provided by your modular system's power supply.

Before connecting any module to the Eurorack bus, it is mandatory to switch the modular system power off. Otherwise you may severely damage your module or put yourself at risk.

Please connect the supplied ribbon cable with the smaller 10-way connector to the module's Eurorack bus connector and with the larger 16-way connector to your modular system bus board.



Eurorack connectors are usually orientated in a way that the -12V supply line is located at the bottom. The cmp1 module follows the same convention.
The red line of the ribbon cable should show to the bottom of your bus board and at the bottom of your module. Refer to the figure above.

Please make sure the ribbon cable does not swap the lines.

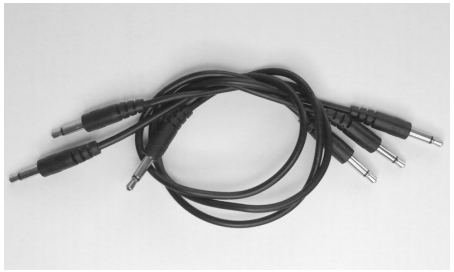
The module can now be installed in the rack using the provided screws, washers and a Phillips head screwdriver #0. With the module installed, switch the system power supply on.

5.2 Signal Connection

The second step is to integrate the cmp1 to your Eurorack system.

Connect an audio signal like a VCO, sound source or any other audio signal to one of the *Main* input and connect the *Out* jack to your studio system.

Connections are made by using mini patch cables. These cables have standard mono male-male mini plugs (3.5mm) and can be bought from any audio store.



6 Device Overview

A Compressor Module for the Eurorack world? Really? Ok, as an outboard gear in a recording studio and maybe as a pedal for guitar, but for a modular? Yes, true! Waldorf made it. The fantastic cmp1 compressor module. It's unusual, but it makes sense and it's worth to be added to your permanent module environment.

The Waldorf cmp1 implements a fully featured analogue compressor with specific CV controls for use in a modular context. The analogue compressor engine is VCA-based using the same components you find otherwise in high-end analogue compressors. Additional features like the output of the detection signal, CV control of compressor ratio and threshold, and the external level input makes the cmp1 a flexible work-horse to be used in many modular patches.

Loops and basses crying out for compression to get fat and juicy. Clicks and bleeps become razor sharp and piercing out your tunes and may you try the classic side chaining effect with uncommon audio sources.

6.1 Inputs

The *Main* input is used to feed the audio through the compressor. If the *Side* input isn't used, the audio from the main input is also used for the level detection circuit.

By using the *Side* input, the level detector is fed by a mix controlled of the *Balance* knob which blends between main and the side signal. If the *Balance* knob is fully opened, the classical side chain compression is applied, if the *Balance* knob is fully closed, only the main signal is used for level detection, and any position in-between allows for flexible control of the level detector.

6.2 Signal Detection

The level detection could be set via the switch into one of three modes. In the left and middle positions an averaging approach will used called RMS (root mean square).

The RMS modes are producing a smooth level detection. The left position (Adapt) will use an adaptive circuit and the middle position a static averaging factor. Just try both modes and let your ears decide.

In the right position the peaks of the input signal will be used to determine the level instead of smoothing them by averaging. This leads to much quicker compression which is for some type of signals favourable.

The detected signal level is available in the special *RMS/Peak* output to be used as a CV modulation source with other modules. In principle this works much like an envelope follower.

6.3 Compression

Compression is controlled by the classical parameters threshold and ratio. When the detected level is above the set threshold, the signal will be lowered in level. The more compression is dialed in, the more the level is attenuated finally approaching the threshold level.

Compression and threshold can be each controlled via its respective CV inputs. In this case the panel knobs will act as attenuators of the CV inputs.

6.4 Attack and Release

When the detected level reaches above threshold, then compression starts in general as already described and ends when the level falls below the threshold.

But this is in addition managed by attack and release times. Attack means that the compressor waits a bit after the threshold level is reached before compression is applied. The longer attack timing is, the more transients of the original signal are unaffected from compression.

Release timing will keep compression active for a bit longer after the level has fallen below threshold. By these fluctuations in level will be smoothed when the signal quickly crosses the threshold.

The *A/R* switch controls if the attack and release timing are either set automatically (position ”Auto”) or manually set by the panel knobs (position ”Man”). When using ”Auto” mode it also works well together with RMS ”Adapt” mode.

The effect of attack and release timings can be visually seen by the two LEDs: The left LED at the *Threshold* knob will be activated when the level is above the threshold, the right LED at the compression knob will be activated when compression will be applied. With attack and release times as short as possible (knobs turned to fully left in manual mode), both LEDs will light up almost simultaneously. When attack and/or release is increased you will see the difference in the timing of the LEDs.

6.5 Level Input

Since the cmp1 compressor is VCA based, you could use the cmp1 as an exponential VCA directly. Just plug a CV signal into the *Level* input and use the *Level* knob as an attenuator for the CV signal. The compression processing is still active. Thus, for using the cmp1 as a pure VCA you would turn *Compression* fully left.

6.6 Output

The *Gain* knob will adjust the overall gain of the processed signal. This becomes important since lowering the threshold and rising the compression ratio will result in an overall lower level. So, typically you would want to rise that level again which is performed by the gain knob. Some amount of automatic gain adjustment is already applied, but adjusting manually gain is always required when threshold or compression ratio changes largely.

In addition to the compressed signal, the *Bleed* knob can be opened to add uncompressed original signal to the output mix.

6.7 Linking Multiple Modules

Multiple cmp1 modules could be linked together for multi-channel compression. Just patch from *Link Out* of the master compressor of the first channel to the next cmp1 module's *Link In* input.

Now, the first module also controls the compression of the second module. For example if you would like to compress a stereo signal, you could further apply the second channel to the side chain input of the first module and put the *Balance* knob to 50/50 position. By this the stereo mix is used for level detection and not just a single channel.

> Hint: Please make sure that the compression knob of the second module is fully closed. The gain, bleed and level knobs are still functional and could be used for additional control.

7 Tips & Tricks

- Use a loop or other rythmnic source and connect the *RMS/Peak* output with a filter or gate input. The detector signal works like an envelope follower.
- Connect a steady tone to the *Main* input and feed a drumloop for example to the *Side* input. Now the steady tone should be modulated by the rhythmic source depending on your *Balance* level.

8 Troubleshooting

8.1 Modules Power Fail

- Check the orientation of the pin headers on your modules
- Check if the total power consumption of your modules does not exceed the specifications of your case/frame power supply

9 Specifications

Power Supply:	+12V/110mA, -12V/100mA
Width:	20HP, 101.6mm
Height:	3U, 133.3mm
Depth:	25mm
Total Weight:	350g

Technical specifications and design are subject to change without notice.

10 Block Diagram