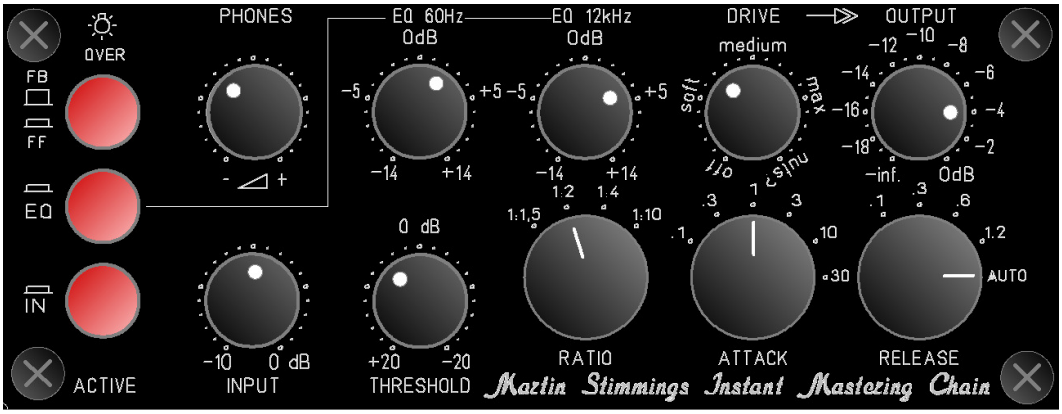
Martin Stimming's
Instant Mastering Chain
v 5.1.7

Set-up and operating instructions



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Introduction

IMC, meanwhile in version 5, is an idea and commissioned work of one of Germany's most credible techno artists: Martin Stimming. The original idea behind IMC is to create a device that is small, light and handy, allowing a liveshow to sound loud and thick without a computer on stage. While being tied to the studio in 2020 and 2021 Stimming found out how useful it is there as well.

The signal path is consistently analog. In the course of development, the operation was then digitized and the circuit itself continuously expanded and supplemented, based on Martin Stimming's experience with the prototype devices in tough live use around the world.

From working together on this device, a friendship arose that spurred each other on to make IMC accessible to everyone.
The result is a device that represents a milestone in technical and practical terms. IMC is elaborately crafted by hand. The "inner values" are excellent and the case (also manufactured by DOCtron) made of carbon underlines the maxim that allows a device in the smallest space, as easy and uncomplicated as possible! An audio processor chain, which otherwise only digitally or with much higher budget and physical space use would be possible.

IMC5 is a sound-shaping device used as a replacement for a classic mastering chain.
Included here is a British-style low and high-shelf EQ with dedicated bypass and a VCA based bus compressor with FF/FB detector path.

The following instructions will now introduce the device in detail. The manual also represents the current state of development.

In this tutorial we're scratching the surface. In the depth you have to go yourself ...

And now have fun with IMC !

Wassertrüdingen, June 2021

Michael „Doc" Schneider,
Doctron

Safety

The blue exclamation mark is an indication to the user about safety-relevant facts and facts relevant to service in this manual.

The listed safety regulations should be carefully observed. Please observe the following instructions and read this manual. For further questions please feel free to contact us.

1. Always use a properly grounded power cord for this product.

Please never remove the ground of the power plug. This connection ensures safe and quiet operation and is absolutely necessary for operation.

2. When installing into a rack, be sure to provide adequate ventilation.

The top and bottom ventilation slots are not decoration and should never be covered during operation. The main reason for technical defects are mostly heat problems. In non-ventilated cabinets, use ventilation panels (1H) between units (even if they don't look very beautiful) to prevent heat build-up.

3. Avoid places with strong magnetic fields.

The housings of the device are designed to protect the sensitive electronics from EMI and RFI. For rack mounting, be sure to place devices with large power supplies or power amplifiers as far away from the unit as possible in the rack. A separate routing of signal and power lines can also help to suppress EMI and RFI as much as possible.

4. Protect your device from moisture and water splashes.

If water has entered the housing, disconnect it immediately from the mains and send it to us for inspection to prevent major damage.

5. If you feel unsure about having to open the device to make settings, check fuses or set / remove jumpers, please contact our support team. We're here to help.

6. Before you open the device to change jumpers or make adjustments, be sure to **unplug the power adapter before opening the case.** Disconnect the device from the mains! Make sure that no foreign parts remain in the device after completion of the work.

We reserve the right to make changes to the design or specifications. If you need help, if you have questions or if you have a defect on the device, please contact us. We're here to help.

Overview

Here is the entire circuit as a block diagram:

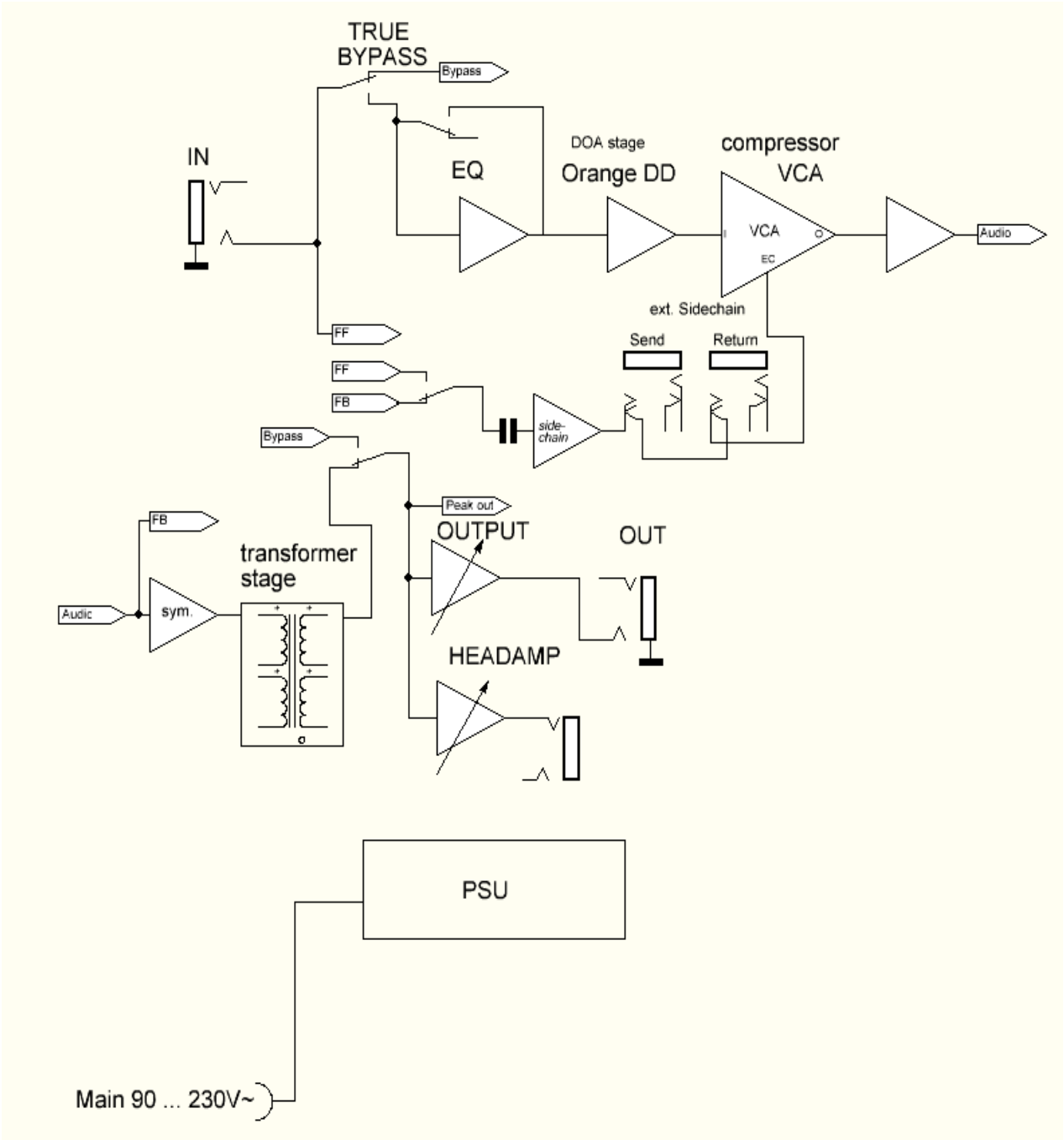


Figure 1: block diagram

 © DOCtron 2021

The individual parts of the circuit will be described later in detail.

The general circuit description is initially limited to the Audiopath.
Since both channels are identical, only the left channel is described here, as shown in the block diagram.
IMC5 has a so-called "true-bypass", which means that the audio signal in the de-energized state is passed uninfluenced from input to output.
The audio signal goes via an isolated 6,3mm jack socket to the treble and bass EQ. Then the audio signal reaches a sound-forming, discrete operational amplifier (ORANGE DD). Now the signal reaches the VCA compressor. The output stage of the compressor reaches a further amplifier stage, which later determines the saturation for the output transformer. The signal conditioned in this way now reaches a balancing driver stage and finally the LUNDAHL output transformer.
At the output of the transformer, the signal is routed to the adjustable Output-Stage and to the headphone amplifier.

The remaining circuit parts work exclusively with control voltage and are not in the audio path. Thus, no interference can enter the signal path. The separation between audio path and control voltages is also made by using 6-way multilayer boards with their own ground layers.
This reduces interference enormously.
New in v5 is also an external Sidechain (Send / Return on the backplane).

The power supply is via an external switching power supply. This power supply must deliver at least 20V-24V. The distribution of the positive and negative supply voltages is carried out in the device by its own sub-switching power supplies.

Due to the conductivity of the carbon casing material, sufficient protection against the outside world is ensured. The interior of the housing no longer needs to be sprayed with conductive ink, as with IMC1.

The individual circuit parts in detail

The power supply:

The external switching power supply is plugged in with a hollow plug on the back of IMC5.
The power supply has a very large voltage and frequency range and should be universally applicable. Please check before connecting the mains connection, if the primary connection corresponds to the specifications on site! **The power plug should be unplugged when connecting or disconnecting the power supply to the IMC.**

The internal overload fuses could trigger. If this is the case, please wait a few minutes. The fuses are self-resetting. IMC5 has comprehensive reverse polarity protection and protection circuits against “phantom-power”. All safety devices are self-resetting. An opening of the housing is therefore not necessary.

In general, all audio connections should be made before power is supplied to the device. In addition to the main connector is a main switch. This switch turns the IMC5 on or off.

Here are the technical data of the external power supply used:

Features and functions of the series

- Table Switching Power Supply
- Closed / Splash proof
- Low standby consumption
- Compact construction
- Overload and short circuit proof
- EU CoC V5 Tier 2 / EnergyStar DOE VI

Power Supply Specifications:

- Input voltage: 90 - 264 V AC / 47 - 63 Hz
- Power: 60W
- Efficiency: DOE VI
- Idle input: <0.15 W
- Isolation: 3000 V AC / 1 min
- Overcurrent protection: short-circuit protection
- Overvoltage protection: 120%
- Output: 24 V DC / 0 - 2.5 A
- Ripple: 350 mVpp
- Weight: 320g

Input and output sockets:

The audio connections are made via 6,3mm jack sockets.
In fact they are "stereo"-jacks, so that symmetrical cables/jacks also could be used. In this case the negative Signal (RING) will be grounded.
IMC5 works internally unbalanced. The problem here is often ground and ground loops resulting from multiple shielding. In a stereo connection thus two (parallel) masses are present. In order to avoid ground loops at this point, there are in each case a jumper "GL" on the board for the left and the right input. If you remove this jumper, the ground of the assigned input is disconnected. The cables are shielded via the upstream device. Thus you can avoid ground loops at the entrance.

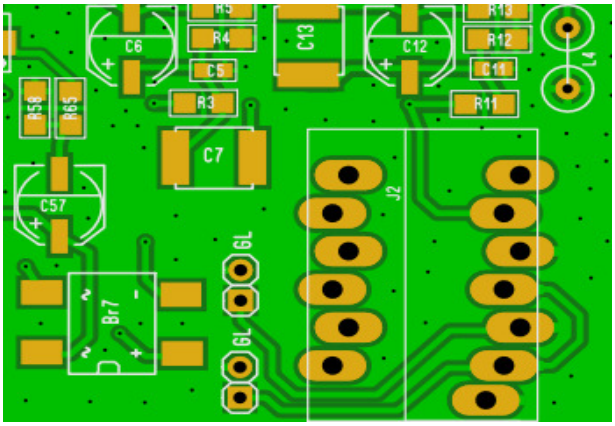
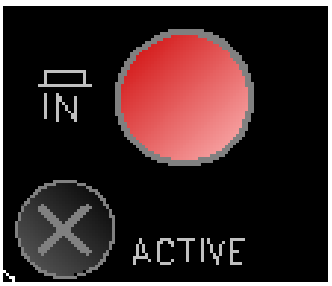


Figure 2: groundlift jumper (GL)

Note: You should always first separate only one channel from the ground. A missing ground connection is definitely buzzing louder than a ground loop!
In fact it is more simple to lift ground at an input or output-cable than opening the unit.

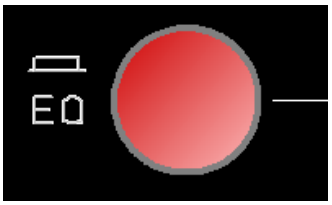
A ground-lift jumper is not provided at the outputs. For testing, the use of a ground-free intermediate plug is recommended.
Simply insert the adapter between Output-Left (or Right) and the following device.
The adapter reliably disconnects the ground to the subsequent connection.

The ACTIVE-Button



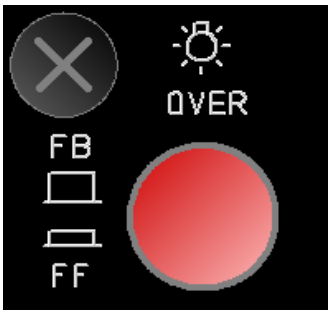
IMC5 has a "true bypass" circuit. This circuit makes it possible for the device to remain in the signal path even without a power supply. In this case, the applied audio signal is switched to the output directly and lossless.
The ACTIVE button on the front left of the front panel allows manual switching of true bypass. A red LED is signalizing an active unit.

The EQ-Button



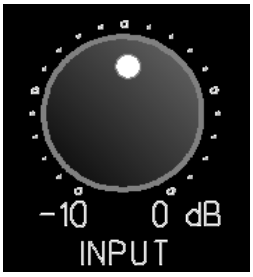
The knob in the middle switches the EQ in the audio-path. A pressed switch causes a red LED to light up and is signalizing an active EQ. Use this switch for a quick check of the defeat signal against the EQ signal.

The FF/FB-Button / OVER-LED



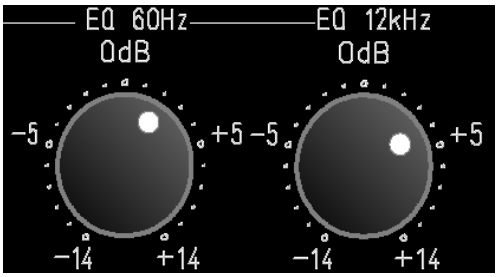
This knob defines the working character of the compressor.
There are two types of signal tap for the sidechain: The feed forward (= FF) is the signal before the compressor tapped, with feed backward (= FB) after the compressor.
Newer compressors work almost exclusively with "Feed Forward" (FF). Many "classics" (such as 1176 or 660) used the Feed Backward (FB) method. The difference between the types: FF intervenes much "harder" in the signal. FB allows a much "gentler" method of compression.
If the knob is pressed the compressor is working in FF-mode. A unpressed knob means that the compressor is working in FB-mode.
The LED inside the switch is a signal overload indicator (OVER). It flashes in case of an output signal greater than +6 dB. It's not a signal indicating distortion! It just informs the user that you are reaching a zone in which you have to be careful not to jump over the top.
The FF/FB-button has no illumination itself.

INPUT



The INPUT potentiometer is an attenuation of the input signal. It reduces the input signal in a range from -10 dB to 0 dB.
Because IMC is a grateful amplifier it needs some “headroom” to work. Also one can reduce the pending signal before reaching the EQ.

The EQ

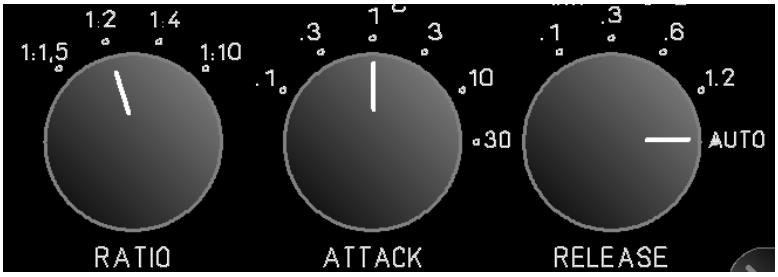


The EQ allows to rearrange the pending signal in a wide range. It is a shelving EQ changing the low signals (approx 60 Hz) and high signals (approx 12 kHz). The range is from -14dB to +14 dB for each frequency range. By toggling the EQ-switch one can switch direct both bands from 0dB (linear) to the selected range.

THRESHOLD

The THRESHOLD determinate s the threshold where the compressor starts to work. In full left position (+20 dB) the compressor won't work. A full right position (-20 dB) means that all signals louder than -20 dB will be compressed. With THRESHOLD one can establish how much compression should be present in the audio-signal.
Threshold determines from which signal threshold the compressor should be present in the audio-signal

The COMPRESSOR



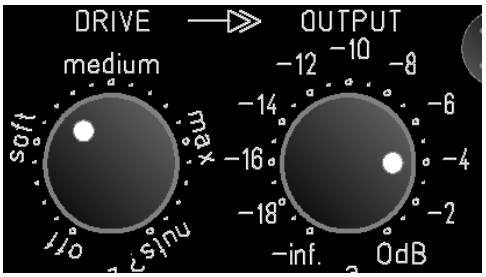
With this three switches one can regulate the parameters of the integrated compressor.

RATIO
Ratio determines the ratio of uncompressed to compressed signal. 1: 1.5 is therefore a slight compression, while 1:10 can be described as a very strong compression.
For sum compression in mastering, a slight compression of 1: 1.5 or 1: 2 is preferred.

ATTACK
Attack determines how fast the compressor should react. The shorter the selected time, the faster the compression will affect the signal. The indicated time for the ATTACK switch is measured in milliseconds (msec).

RELEASE
Release determines the time after which the compressor "releases" the signal again. The longer the release, the longer it takes for the compressed level to return to an uncompressed state.
A special feature is the setting "AUTO". In this setting, the release time is automatically determined by the applied signal. The compressor then adjusts the release time to the program material.
The indicated time for the REALEASE switch is measured in seconds (sec).

DRIVE & OUTPUT

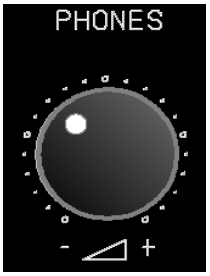


These two potentiometer are the most important parameter for the unique IMC-circuit. They determinate how "fat" the output signal will sound.

DRIVE determinates how much the integrated transformer will be driven in saturation and with OUTPUT one can regulate the signal back into "real world". With DRIVE you put your audio signal right before the distortion limit and with OUTPUT you can handle the amount of "coloring" the transformer output while also reducing the output level.

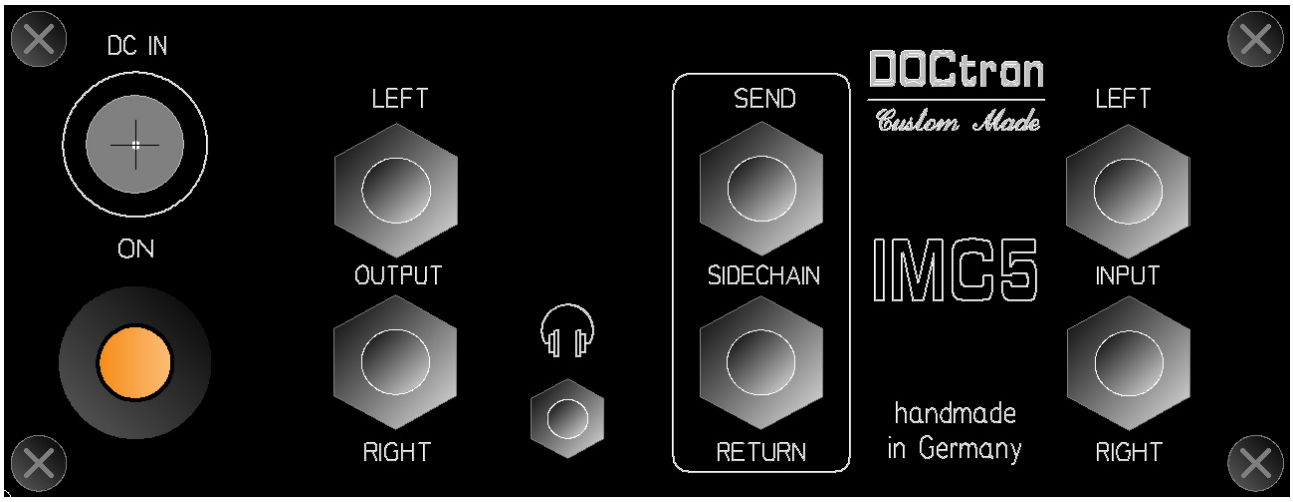
To say it clear: IMC is a pure analog machine. There are no "parental controls"! If you choose to put DRIVE to the nuts?-position you will get a horrible distorted signal.

PHONES



The output-jack for the headphones is on the back (3,5mm stereo jack).
With the PHONES potentiometer you can regulate the volume for your headphones.
The integrated headamp is intended for usual in-ears with an impendance grater than 20 Ohms. It also can be used as a line-level monitor-out.
Please switch the unit off before connecting your phones to IMC and please reduce the PHONES-level to minimum before putting the phones in your ear.
BE CAREFUL WITH THE VOLUME. DON'T HEAR TOO LOUD. YOU ONLY HAVE ONE PAIR OF EARS!!

Backplate / Connections



POWER
Connect the power adapter to DC IN.
Please make all connections before switching the unit ON.
The power switch has an orange indicator when pressed (also visible without power connected)

INPUT
Connect your Audio-signal to INPUT LEFT and RIGHT. You can use 6,3mm mono or stereo plugs. If you use stereo or symmetrical plugs the "ring" (negative signal) will internally bridged to ground.

OUTPUT
Connect OUTPUT LEFT and RIGHT to the following device. You can use 6,3mm mono or stereo plugs. If you use stereo or symmetrical plugs the "ring" (negative signal) will internally bridged to ground.

PROTECTION
All inputs and outputs are protected against phantom power or other DC-voltages. Nevertheless please be careful to **switch phantom power off** because the protection can degrade the audio-signal!

SIDECHAIN
With SIDECHAIN SEND and RETURN you can influence the control voltage of the compressor. You can insert an Equalizer, for example, to influence the frequency-range the compressor will compress.
You can also insert a different audio signal (only the bassdrum for example) for the compressor to react differently.
Important: The external sidechain is NOT in the signal-path. You only handle control-voltage which influences the VCA-compressor.
If no plug is inserted the SIDECHAIN is out of the chain. If you plug something in the SEND or RETURN plug the control-voltage is interrupted. As long as there is no external device connected and only a plug is inserted, the compressor won't work! No sidechain – no compression.
Connect the output of your external device to SEND and the input to RETURN
The Sidechain is MONO. You can plug mono or stereo plugs in the sidechain. The "ring" of a stereo-connector is internally not connected.

Technical specifications

Here are the mandatory technical data of the device.

Frequency response:	+0.13 dB, -0.18 dB
Noise level:	-108 dB (A)
Dynamic range:	108 dB (A)
THD:	0,0099 %
Stereo cross-talk	- 101,3 dB (A)
IMD at 10 kHz	0,0186 %
primary voltage:	90 - 264 V ~
el. power:	10 Watt (max)
Input Voltage Range	27,5 dBu
Input Impedance	47 kΩ
PSRR	90 dB
Max. Output Level	+24 dBu@20Hz (load 600Ω)
Gewicht:	
IMC	~ 1000g

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