

DRAWMER



OPTO COMPRESSOR FOR 500 SERIES RACK SYSTEMS

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ONE YEAR LIMITED WARRANTY

Drawmer Electronics Ltd., warrants the Drawmer OC1 500 Series Opto Compressor to conform substantially to the specifications of this manual for a period of one year from the original date of purchase when used in accordance with the specifications detailed in this manual. In the case of a valid warranty claim, your sole and exclusive remedy and Drawmer's entire liability under any theory of liability will be to, at Drawmer's discretion, repair or replace the product without charge, or, if not possible, to refund the purchase price to you. This warranty is not transferable. It applies only to the original purchaser of the product.

For warranty service please call your local Drawmer dealer. Alternatively call Drawmer Electronics Ltd. at +44 (0)1709 527574. Then ship the defective product, with transportation and insurance charges pre-paid, to Drawmer Electronics Ltd., Coleman Street, Parkgate, Rotherham, S62 6EL UK. Write the RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem. Drawmer will not accept responsibility for loss or damage during transit.

This warranty is void if the product has been damaged by misuse, modification, unauthorised repair or installed with other equipment that proved to be faulty.

THIS WARRANTY IS IN LIEU OF ALL WARRANTIES, WHETHER ORAL OR WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. DRAWMER MAKES NO OTHER WARRANTY EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. PURCHASER'S SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE REPAIR OR REPLACEMENT AS SPECIFIED HEREIN. IN NO EVENT WILL DRAWMER ELECTRONICS LTD. BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECT IN THE PRODUCT, INCLUDING LOST PROFITS, DAMAGE TO PROPERTY, AND, TO THE EXTENT PERMITTED BY LAW, DAMAGE FOR PERSONAL INJURY, EVEN IF DRAWMER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states and specific countries do not allow the exclusion of implied warranties or limitations on how long an implied warranty may last, so the above limitations may not apply to you. This warranty gives you specific legal rights. You may have additional rights that vary from state to state, and country to country.

For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off an on, then the user is encouraged to try to correct the interference by one or more of the following measures:

Re-orient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Unauthorised changes or modification to this system can void the users' authority to operate this equipment.

This equipment requires shielded interface cables in order to meet FCC class B limit.

For Canada

CLASS B NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASSE B AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Règlement des signaux parasites par le ministère Canadien des Communications.

SAFETY CONSIDERATIONS

CAUTION - SERVICING

DO NOT PERFORM ANY SERVICING. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE
THIS EQUIPMENT TO RAIN OR MOISTURE.

WARNING

PLEASE BE SURE TO POWER OFF YOUR 500 SERIES RACK BEFORE INSTALLING OR REMOVING
THIS OR ANY OTHER 500 SERIES MODULE. HOT SWAPPING COULD CAUSE DAMAGE TO THIS OR
OTHER EQUIPMENT.

**In the interests of product development, Drawmer reserve the right to modify
or improve specifications of this product at any time, without prior notice.**



Opto Compressor FOR THE 500 SERIES RACK

The OC1 brings optical compression to the **DRAWMER** range. Opto compressors respond with more hysteresis than other types of compression, such as FET, and soften the edges in a manner that feels organic, smooth, warm and natural-sounding all audio sources. However, it is particularly good for vocals and acoustic guitars.

The OC1 is a single-channel unit with optional multi-module linking. Alongside standard controls like Input Gain, Threshold, Ratio,

Attack, and Release, it includes BIG and AIR modes to enhance low-end warmth and high-end clarity. A PGM mode adds adaptive release timing to minimise pumping during heavy compression. The OC1 features a Mix control for parallel compression and a CRUSH harmonic function for added musical saturation. Precision stepped potentiometers ensure accurate recall, while comprehensive metering displays gain reduction and signal levels.

- Full featured natural & musical soft-knee Optical design.
- All the familiar compressor controls and recallable through 21 dented steps on each.
- Input & Output Cut/Boost to get your levels perfect.
- BIG & AIR modes enhance low-end weight and high-end clarity without harshness or over-compression.
- Side-Chain Linking
- Integrated 'CRUSH' feature that warms up your mix with harmonic saturation.
- Wet/Dry Mix provides effortless parallel compression.
- Hard wired bypass.
- Designed & handmade by **DRAWMER** in the U.K.

Typical characteristics:

Smooth and Musical
Natural

Contributes warmth and fullness

Typical Applications:

Vocals: Excellent for creating a smooth effect, thanks to its soft, musical release curve.

Bass: Even out volume variations, resulting in a naturally sustained sound.

Strings / Piano: Is particularly useful on melodic instruments by avoiding excessive emphasis on transients.

Mix Bus: Provides a gentle, musical glue.

INSTALLATION

Congratulations on purchasing your new Drawmer product. In order to protect your new investment, please take a few moments to fill out the warranty registration card provided in the box, or alternatively visit our website at www.drawmer.com and fill out the form online.

Quick and easy to do, registering your audio product is important and helps to serve as proof of ownership for any future warranty issues.

The OC1 does not function stand alone and requires the power supply and the audio connectors provided by an API 500 series compatible rack frame (not included).

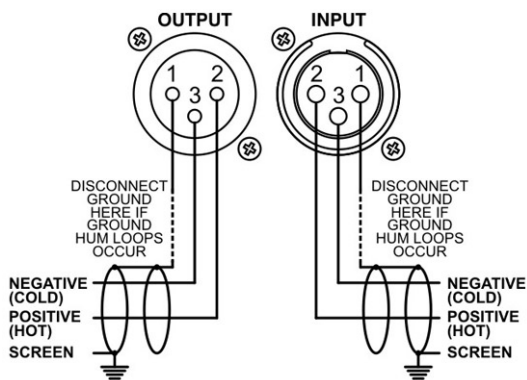
Installing the OC1 into a 500 Series compatible rack.

1. It is essential to consult the manual provided with the 500 series rack, as it should contain all the necessary information for the installation procedure.
2. The OC1 requires one 500 series slot.
3. Prior to installing or replacing the OC1 module, ensure that your 500 series rack is powered off and that the power cable is disconnected.
4. Position the OC1 module into the adjacent vacant slot within your rack, ensuring that the connectors of the module are accurately aligned with the connectors of the rack.
5. Gently press the OC1 module into the rack connectors, being careful not to use excessive force, and secure it by tightening the screws on the front panel.
6. Connect the OC1 module to your audio setup using the connections available on your 500 series rack.
7. Finally, reconnect the power cable to the 500 series rack and turn it on.

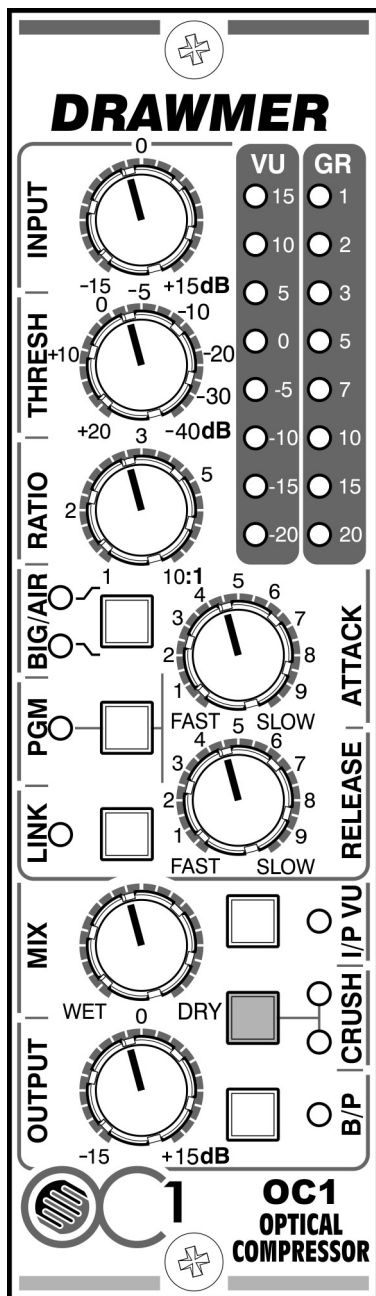
AUDIO CONNECTIONS

The inputs and outputs found on the back of the 500 rack are electronically balanced on conventionally wired XLRs (pin 1 screen, pin 2 hot, pin 3 cold and XLR shell is connected to chassis). The use of balanced wiring is recommended.

(Please consult your 500 series manual for further information).



CONTROL DESCRIPTION



INPUT -15dB to +15dB

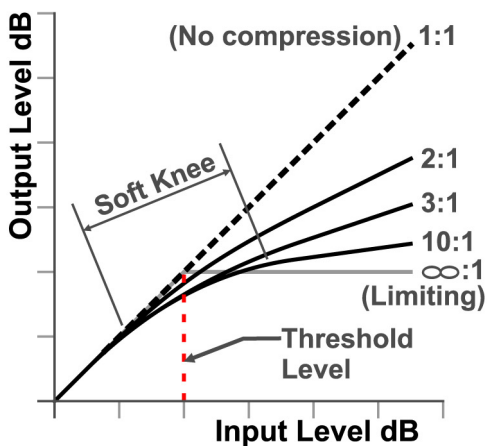
Determines the input level.

THRESHOLD +20dB to -40dB

Determines the signal level above which gain reduction will be applied. In order to provide as transparent processing as possible Soft knee compression takes place for signals exceeding the threshold level by a few decibels, above which level conventional 'ratio' compression is applied.

RATIO 1:1 to 10:1

Sets the final compression ratio that will be applied once the 'soft-knee' region of the threshold control is exceeded. A ratio of 1:1 provides no compression.



Common ratios include:

2:1 Soft: Gentle, natural compression.

4:1 Moderate: For vocals and acoustic instruments.

8:1 Hard: Aggressive, for controlling loud peaks.

10:1 Limiting: Hard compression. Essential for preventing clipping, but can squash transients if applied too heavily.

BIG/AIR Off - Big - Air & Air

Multiple presses toggle the switch through Off, Big, Air and then Big & Air.

With the switch set in the Big position the side chain's sensitivity to low frequencies is reduced, with the result that less gain reduction is applied to those frequencies, creating the effect that the bass is louder or 'bigger'. It also has the benefit of reducing the ducking and pumping effect that occurs by high frequencies being 'pulled down' in sync with the bass, helping to make mix compression much more affable.

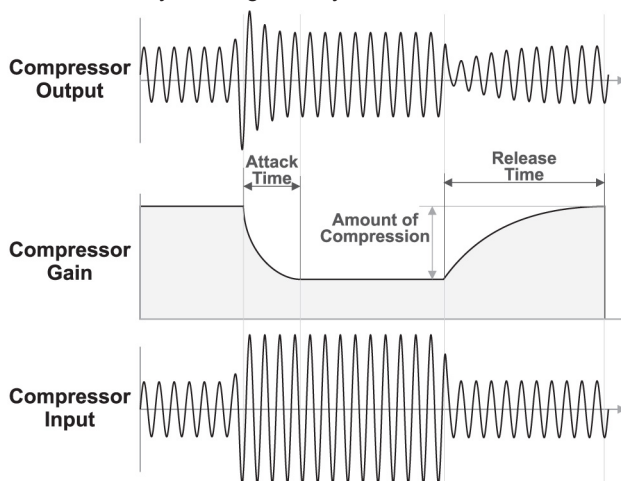
With the switch set in the Air position the side chain's sensitivity to high frequencies is reduced, the result being that the treble sounds more intimate, detailed and transparent, but without making it sound harsh or introducing any noticeably unnatural artefacts, adding definition, particularly to the human voice and acoustic instruments. Cymbals are more vibrant without becoming splashy, and vocals sound more open but without becoming sibilant.

ATTACK Fast - Slow

Controls the speed that the compressor responds to signals that exceed the level set by threshold. For most musical uses, an initial attack setting of between 1 and 20 mS is typical and least obtrusive, with slower settings allowing the start of a percussive or transient signal to pass unaltered, before the compressor reacts. However, bringing the level under control quickly, using a very fast attack time, generally gives more natural results on vocals and mixes.

RELEASE: Fast - Slow

Sets the time taken for the signal to return to normal after the input level has fallen below threshold. For most signals a fairly fast setting is a good starting point. Be careful with very long release settings, the Compressor might never have enough time for a total recovery between the signal peaks. However, if set too fast, the signal may "pump", which can be used creatively, but is generally undesirable.



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PGM Off - On

When selected, PGM disables the Attack and Release controls and continually optimise the attack and release times to suit the dynamics of the material being processed. Enabling this setting will often produce the subtlest level control on signals with widely varying dynamics or complete mixes.

LINK Off - On

The side chain of multiple OC1 modules can be linked so that the gain reduction of each synchronise together. In this instance the module requiring the highest gain reduction is master and trigger for all the other linked modules. The link feature includes the Big and Air, Threshold and Ratio controls, however, the Attack and Release remain independent to allow for varying transients throughout the modules.

N.B. The link function utilises the side chain link feature on pin 6 of the chassis. However, this is not a standard API series specification, so please check that your chassis has the feature, as many modern units do, and also how to implement it.

VU METER:

Eight LEDs at +15, +10, +5, 0, -5, -10, -15, -20dB

GAIN REDUCTION METER:

Eight LEDs at -1, -2, -3, -5, -7, -10, -15, -20dB

MIX WET - DRY

By mixing the amount of signal from the input (dry) with the (wet) compressed signal the overall amount of compression of the signal can be altered. In a method similar to parallel compression, but with the advantage of being one simple variable MIX knob, rather than altering several settings.

I/P VU Off - On

When selected, the VU meter displays the signal at the input level control.

CRUSH Off - On

When active adds musically pleasing harmonic distortion to the signal.

The feature works progressively in direct correlation to the Input gain control: as the input is boosted more distortion occurs. In addition to an active LED a progressive crush LED shows the amount of harmonic distortion occurring and lights up brighter the more the crush is driven. If you wish to apply much more gain in order to obtain more 'crush' be sure to keep an eye on the meters and use the OUTPUT to control the levels. Use the switch to listen to A/B comparisons to hear the effectiveness of the feature.

OUTPUT -15dB - +15dB

During compression the signal is attenuated and gain may be required to produce the required output level. The amount of gain required in order to bring the signal level to the same as at input is displayed on the G.R. meter. Adjust the gain so that the output VU signal approaches the desired level only on signal peaks.

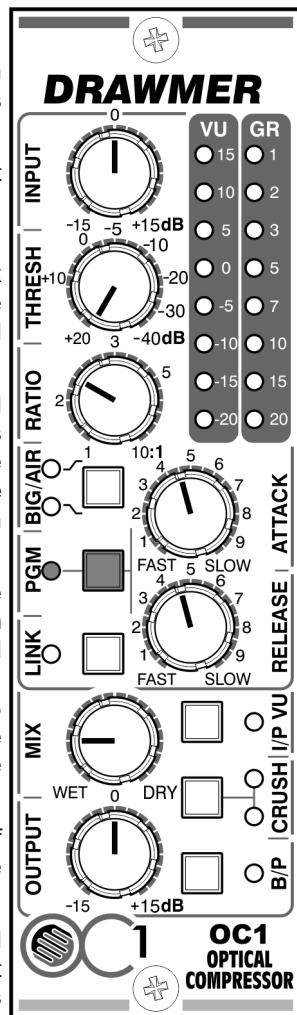
BYPASS (B/P) Off - On

A fully balanced hard-wire bypass connects the input directly to the output, enabling an instant wet/dry comparison.

OPERATION

THE SETUP PROCEDURE

- Initially, set the I/P VU switch on to see the input level on the VU meter. Set the level so that the meter reaches 0dB on signal peaks.
- Switch the I/P VU switch off to see the output level at the VU meter.
- Set the Threshold at +20, Big and Air off, and the PGM switch on, so the Attack and Release are on Auto. Mix should be set to almost fully wet but not quite, so more compression could be applied easily if required, and Output level at 0dB.
- The Ratio setting depends on how firmly the signal dynamics need controlling; as a rule, higher ratios provide a higher degree of control but also tend to be more audible when high levels of gain reduction are required. We suggest less than 2.5:1 for vocals, even less for full mixes, and more for dynamic single tracks.
- Setting up is now simply a matter of adjusting the Threshold control until the desired amount of gain reduction occurs. This is judged partly by ear and partly by observing the gain reduction meter. Usually, a maximum gain reduction of between 8dB and 12dB will be adequate. The ideal is to set it nicely above the "comfort" level whilst below the "danger" level, to capture the performer's dynamics but catch any peaks that occur.
- Next adjust the MIX to obtain the desired amount of compression, and fine tune the Output gain so that the VU meter reads the desired output on signal peaks.
- At this point, the PGM switch may be disabled if manual control is wanted. For most musical uses, a fairly fast initial attack setting is typical. A slow attack time is often used to accentuate the beginning of percussive or plucked sounds. A fast attack time will bring the input signal under control very quickly to catch any peaks.
- For most signals a fairly fast Release setting is a good starting point, and adjust to suit the music, but be aware of pumping.
- If some harmonic distortion is desired activate the Crush switch. Adjust the Input gain to adjust the amount of Crush required, the more gain the more Crush, but be sure to keep an eye on the meters and use the OUTPUT to control the final level.



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Note that the OC1 it features a temperature control oven around the optical element and requires 3-5 minutes to achieve optimum temperature.

PUMPING

Pumping is more often than not an indication that Release is set wrongly. Manual Release time should be set short enough so that the system gain control has returned to normal before the next signal peak occurs, and, in general, it should be set as short as possible before audible gain pumping occurs.

APPARENT DULLNESS OF COMPRESSED MATERIAL

It is a common accusation that compressors diminish the sound they process. The bass sounds in normal music carry the majority of the energy. The compressor is activated by this strong energy, which lowers the volume of any high-frequency, softer noises that coincide with the bass sound. This explains why anytime a big bass drum or snare drum beat appears in a heavily compressed drum sound, the cymbals and hi-hats appear to drop in level.

In order to let the leading edge of the brighter sounds run through the compressor before the gain decrease happens, the option is to either apply less compression or extend the attack time. The OC1 soft-knee compression tends to reduce this side effect, but in severe situations, equalisation may be required to give a little artificial brightness to the processed sound.

USES

Opto compressors respond with more hysteresis than other types of compression, such as FET, and soften the edges in a manner that feels organic, resulting in a naturally smooth and musical output.

Typical characteristics:

- Attack and release dependent on the program
- Soft compression curve
- Contributes warmth and fullness

Best Uses:

Vocals: Excellent for creating a smooth effect, thanks to its soft, musical release curve.

Bass: Even out volume variations, resulting in a naturally sustained sound.

Strings/Piano: Works well with melodic instruments by avoiding excessive emphasis on transients.

Mix Bus: Provides a gentle, musical glue.

or any sound that needs gentle levelling and smoothing.

OC1 GENERAL INFORMATION**IF A FAULT DEVELOPS**

For warranty service please call Drawmer Electronics Ltd. or their nearest authorised service facility, giving full details of the difficulty.

A list of all main dealers can be found on the Drawmer webpages.

On receipt of this information, service or shipping instructions will be forwarded to you.

No equipment should be returned under the warranty without prior consent from Drawmer or their authorised representative.

For service claims under the warranty agreement a service Returns Authorisation (RA) number will be issued.

Write this RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem.

Authorised returns should be prepaid and must be insured.

All Drawmer products are packaged in specially designed containers for protection. If the unit is to be returned, the original container must be used. If this container is not available, then the equipment should be packaged in substantial shock-proof material, capable of withstanding the handling for the transit.

CONTACTING DRAWMER

Drawmer Electronics Ltd., will be pleased to answer all application questions to enhance your usage of this equipment.
Please address correspondence to:

Drawmer (Technical Help line)
Coleman Street
Parkgate
Rotherham
S62 6EL
UK

Alternatively contact us by E-mail on :
tech@drawmer.com

Further information on all Drawmer dealers, Authorised service departments and other contact information can be obtained from our web pages on:
<http://www.drawmer.com>

SPECIFICATION**INPUT**

Input Impedance	20K Ohms
Maximum Input Level	+18dBu

OUTPUT

Output Impedance	<100 Ohms
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FREQUENCY RESPONSE

20Hz - 20kHz	+/-0.2dB
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% THD & NOISE

@1KHz ref 0dBu	0.04%
@1KHz ref 10dBu	1%

NOISE AT UNITY GAIN

on DRY Mix Control	-98dBu
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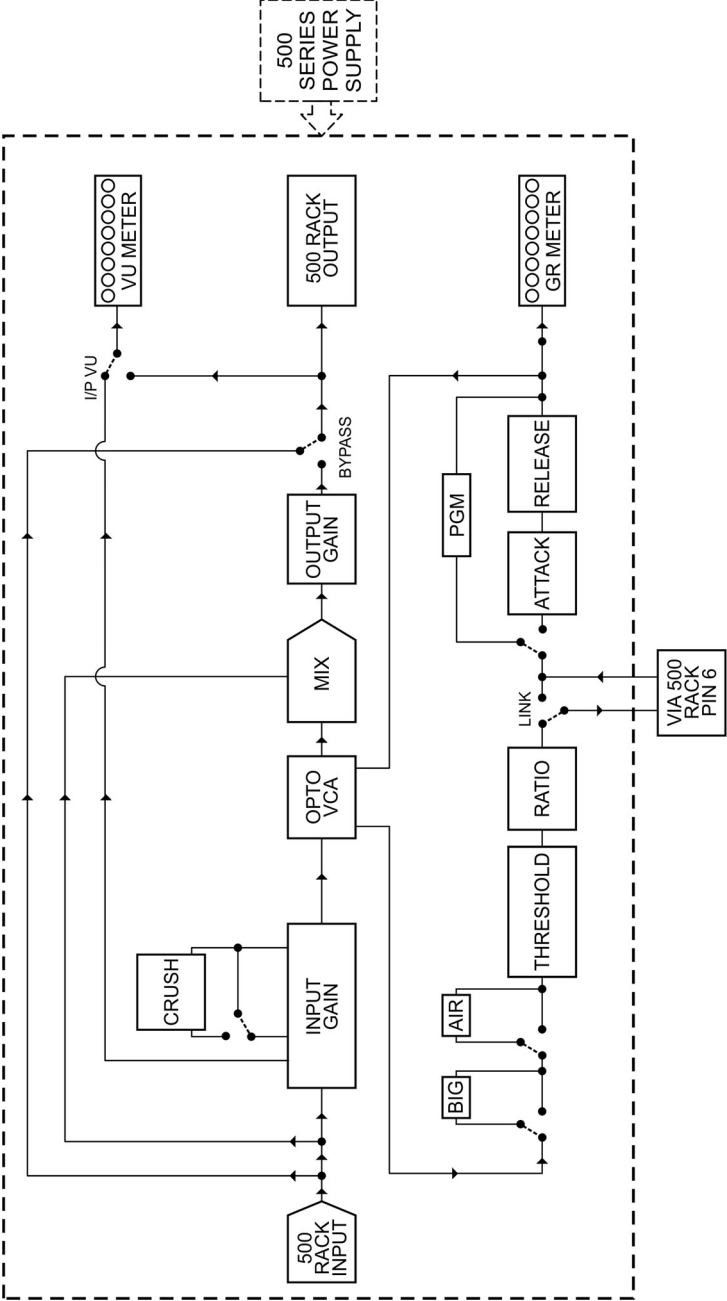
SIZE

One 500 Series slot

WEIGHT

0.38Kg

BLOCK DIAGRAM





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INPUT

0
-15 +15dB

THRESH

+10 0 -10
+20 3 -40dB

RATIO

2 5

BIG/AIR

1 10:1 5

PGM

FAST 5 SLOW

LINK

2 3 4 5 6 7 8 9

MIX

WET 0 DRY

OUTPUT

-15 +15dB

VU

15 10 5 0 -5 -10 -15 -20

GR

1 2 3 5 7 10 15 20

ATTACK

RELEASE

CRUSH

B/P



1

OC1
OPTICAL
COMPRESSOR



DRAWMER OC1 Session Recall

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Rotherham ~ S. Yorkshire ~ UK

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Rack Details	
Session No.	
Date	
Artist	
Tape Location	