

MASELEC

MLA-2 precision stereo compressor



1. INTRODUCTION

The MLA-2 Precision 2-Channel Compressor is intended for professional audio use in recording, mixing and mastering applications where high performance is required.

The MLA-2 provides a unique set of tools, carefully crafted to provide a compressor whose sonic character was the most important design objective. The unique character of the device is evident in the technical description of the behaviour of the device.

2. SUMMARY OF MLA-2 FEATURES

Operational:

- Easy to operate with input gain controlling compression depth (drive)
- Minimal gain adjustment needed when changing ratio
- Optical gain element for smoothness and freedom from noise
- Dynamically-controlled attack and release to minimize pumping
- Precision stepped controls
- “ImageLink” Intelligent dynamic stereo linking system
- Output gain make-up
- Switchable metering (VU): gain reduction or signal level

Technical:

- Low noise
- Extended headroom with maximum input amplitude of +28dBu
- Extended frequency response
- Low distortion
- Electronically balanced inputs and outputs

3. GETTING STARTED

It is not necessary to read the entire manual before being able to use the MLA-2. This section contains all the information required for you to get going.

3.1. Unpacking your MLA-2

Check that the slide switch mounted on the rear panel is set to the correct mains voltage range.

115V setting: 90V-130V ac 50-60Hz

230V setting: 180-260Vac 50-60Hz

The plug fitted to the mains lead must be of the correct type.
If not, DO NOT CONNECT THE MAINS SUPPLY.

Please keep the packaging for re-use in the event that the unit should be shipped to another location or if it ever needs to be returned to the retailer or distributor.

3.2. Using the MLA-2 for the first time

Refer to section 21 for wiring details of connecting leads.

- Connect a source of balanced audio to the input connectors on the MLA-2.
- Connect the output of the MLA-2 to a balanced audio input.
- Connect the mains supply to the MLA-2 unit.

There is a main power switch on the rear of the unit and an auxiliary (standby) switch on the front, which is more convenient to use if the equipment is rack mounted and the rear panel is inaccessible

The indicator lamp in the rear-mounted mains switch should illuminate when switched on. If it fails to light the power may be absent or the unit may be faulty. Check the fuse and replace if it is blown. (315mA, slow blow).

If the problem is still evident contact your retailer or distributor.

Set the rear-panel Threshold switch to:

- 'Low' for recording or
- 'High' for mastering or for working on a stereo mix.

Switch the secondary power switch on the front of the MEA-2 to 'ON'.

Set the meter function switch to 'G.R.' (Gain Reduction).

Set the Compressor In/Out switch to 'In'.

By momentarily muting or disconnecting the inputs, check that the meter indication is 0dB.

Re-connect or un-mute the inputs.

A suggested starting point for control settings is:

- Ratio: 2
- Attack: 0.100
- Release: 0.10
- Input Gain: -10dB
- Output Gain: +10dB

(all controls set to 12 o'clock position)

The unit is now ready to use.

3.3. MLA-2 product concept and capabilities

The MLA-2 Precision 2-Channel Compressor is designed to provide very high quality signal processing for the most demanding professional applications. It has been carefully developed in conjunction with balance engineers, producers and mastering engineers to be easy to use, and to provide a natural and warm sound and to offer a greater degree of transparency in the presence of compression.

The MLA-2 also offers precision controls, which enable exact re-creation of previously used configurations.

3.4. Driving the compressor

Early compressors or limiting amplifiers had few controls and were simple to operate. Many such devices are still popular today, despite the limitations of their early technology.

Such devices often employed a 'drive' control, which provided progressively more compression (depth) and input gain when rotated.

Some later devices split this function into two controls, which would have to be operated together to achieve the same progressive effect without marked shifts in signal amplitude.

The MLA-2 uses the 'drive' principle and the control is called 'Input Gain'. The compression threshold is left unchanged while the input gain is adjusted to alter compression depth. This has the advantage that gain and compression depth are adjusted together and so peak level will only vary by a small amount, determined by the 'ratio', which sets the severity of compression.

Therefore to increase the depth of compression, or to bring the quieter parts of the mix or instrument dynamics forward, simply rotate the input gain control clockwise until the desired effect is obtained.

Another problem with less sophisticated designs is that as the 'ratio' is increased the output level drops.

The MLA-2 reduces this effect, particularly for moderate amounts of gain reduction, by making automatic adjustments to the threshold, depending on the ratio setting.

This results in less variation on output level, for a given input range, when the ratio is varied.

For larger amounts of gain reduction it might be necessary to compensate by adjusting the 'output gain'.

In general, for *mastering* applications use the 'High' threshold setting (switch on the rear of the MLA-2)

And for *recording* applications (such as for an instrument, in an insert point) use the 'Low' threshold setting.

Please note: 'High' setting changes the 0 VU setting to +10dBu (6dB higher)

3.5. Dynamic behaviour

The gain element of the MLA-2 is an optical device.

This provides a smooth transition between linear and compressed operation with a low level of noise and distortion.

One of the main problems for compressors is recovery after loud transients, often called 'pumping'.

To avoid this the attack and release times of the MLA-2 are dynamically controlled - i.e. program dependent.

In short, the nominal attack and release times set by the controls are modified according to the program content. This is a key feature of the MLA-2 and one which enables the device to operate effectively and transparently on the most difficult signals without introducing the excessive distortion or pumping.

4. OPERATION

The unit is designed for either stereo or 2-channel operation and each channel is controlled independently by an identical set of controls.

A linking facility is provided that enables tracking of the two channels for stereo operation. When selected, stereo linking is intelligently controlled by the "ImageLink" system described below.

Each channel has controls for:

- Compressor in/out
- Input gain
- Output gain
- Ratio
- Attack
- Release

Some of these parameters are dynamically controlled. More detailed descriptions are provided below.

Metering is provided for each channel and meter function may be signal amplitude (VU dynamic characteristic) or gain reduction (GR) according to the 'meter' function switch. The meter scale is in dB units.

There is a global threshold selection, provided by a toggle switch on the rear of the unit. This is designed to be set at installation and should not require changing afterwards.

See section 20 for details of the threshold range switch.

The Threshold toggle switch affects the meter in VU mode:

- Normal Threshold setting (on the back): 0 VU = +4dBu
- High Threshold setting: 0 VU = +10dBu

The MLA-2 is galvanically bypassed (inputs and outputs) when the power is off.

4.1. Input gain

This control attenuates the input audio signal *before* the gain-reduction (compressor) circuit, over the range 0dB to -20dB in 1dB steps. Increasing the input gain (or reducing attenuation) will drive the compressor harder. The depth of compression will be increased.

Output level will also increase, subject to other settings including the compression ratio and attack and release times and the audio signal amplitude and dynamics.

Increasing the input gain can not cause overload.

4.2. Output gain

This control increases the output audio amplitude *after* the gain-reduction circuit, over the range 0dB to +20dB in 1dB steps.

The Output gain control does not affect the amount of gain-reduction (compression).

[Note: Refer to section 3.3 for a brief overview of MLA-2 operation]

4.3. Ratio

This control adjusts the severity of the compression applied to loud signals (i.e. those which exceed the compression threshold).

The MLA-2 automatically adjusts the threshold to maintain output level for small amounts of gain-reduction (< 4dB GR).

Ratios available: 1.4:1 , 1.7:1 , 2:1 , 3:1 , 5:1 , 8:1

4.4. Attack time

Setting of this control will determine the attack-time. For real audio programme with complex waveforms the setting will indicate the *average* attack-time.

[Note: Refer to section 3.3 for a brief overview of MLA-2 operation]

Nominal attack times (ms/dB) are: 0.005 , 0.020 , 0.100 , 0.500 , 1.0 , 1.5

4.5. Release time

Setting of this control will determine the release-time. For real audio programme with complex waveforms the setting indicates the *maximum* release-time caused.

Short duration peaks will not cause long release times.

[Note: Refer to section 3.3 for a brief overview of MLA-2 operation]

Nominal release rates (sec/dB) are: 0.02 , 0.05 , 0.10 , 0.20 , 0.40 , 1.0

4.6. VU / GR

This control switches the meter reading between:

- vu Meter displays the output level.
- g.r. Meter displays the average gain-reduction (dB).

4.7. Compressor in/out

This control switches the compressor, including input gain and output gain controls, in and out of circuit.

- out: Compressor by-passed. Meter displays input amplitude in VU mode.
- in: Gain-reduction (compressor) circuit is active.

4.8. Compressor indicator lamp

This bi-colour indicator indicates if the compressor's gain reduction circuit is active:

Green Indicates that the compressor is in circuit (on).

Red The colour changes to red when the input signal causes gain reduction. This is particularly useful when the two channels are stereo linked, as the VU meters will not show which channel is causing the gain reduction (dominating). The light will also assist when the unit is located at a greater distance from the user.

4.9. Stereo linking

This switch enables the intelligent "Image-Link" system that matches the gain reduction applied to both channels. The linking is *programme dependant*.

Momentary gain-reduction due to short duration peaks will not be linked.

This technique maintains the integrity of the stereo image, while avoiding obvious pumping effects resulting from momentary transients on one channel.

The ImageLink system is independent of all other controls. Different ratio, attack and release can be set to either channel.

4.10. Threshold range

This control is located on the rear panel and is designed to be pre-set at the time of installation. It selects between two ranges, 'Normal' for studio use and 'High' for Mastering use.

In the 'High' setting, for a given audio programme the depth of compression will be less.

The compression threshold is modified dynamically within these ranges by the MLA-2 control circuitry, according to programme content.

Normal Threshold: Threshold range -10.5 dBu to +14.5dBu

High Threshold: Threshold range -1.5dBu to +23.5dBu

5. CONNECTORS

The MLA-2 has symmetrical input and output amplifiers with no impedance or loading difference between pin 2 and pin 3.

Some users and equipment use pin 2 as 'hot' and pin 3 as 'cold', others implement the opposite.

The MLA-2 works perfectly in both cases.

Balanced analogue audio connections should use a good-quality screened twisted-pair lead. Unbalanced connections must also be screened.

The inputs are 'ground floating', and both pin 2 and pin 3 must be connected.

5.1. Output connections

The outputs are electronically balanced and both pin 2 and pin 3 must be connected.

The level remains unchanged when an output is driving an unbalanced input.

Note: When driving unbalanced loads with the MLA-2 the maximum output level is reduced by approximately 6dB from the nominal +28dBu.

5.2. Rear panel connectors

A. Audio I/O

- Left Channel Input
- Left Channel Output
- Right Channel Input
- Right Channel Output

B. Earthing Stud – Connected to mains earth and the case

C. IEC Mains Inlet (fused).

6. SPECIFICATION

6.1. Analogue inputs

The analogue inputs are on three pin gold plated Neutrik XLR connectors with signal on pins 2 and 3 respectively, and screen on pin 1.

Pins 2 & 3 have a very high impedance path to earth.

Differential input impedance: 100kohm (pin 2 to pin 3)

Unbalanced input impedance: 100kohm (pin 1 to 2 or 3)

6.2. Analogue outputs

The analogue outputs are on three pin gold plated Neutrik XLR connectors with signal on pins 2 and 3 respectively, and the screen on pin 1.

Output impedance: 33ohm (pin 2 to pin 3, balanced)

Unbalanced output impedance: 33ohm (pin 1 to 2 or 3)

6.3. Performance specification

in/out switches are illuminated and other settings are:

- Input Gain: -10dB
- Output Gain: +10dB
- Threshold: High
- Ratio: 2:1
- Attack: 0.100ms/dB
- Release: 0.10sec/dB

Maximum input amplitude: +29dBu

Output noise: Compressor out < -99dBu

Compressor in < -93dBu

Frequency response: + 0.1, -0.4dB, <1Hz to > 50 kHz

Crosstalk: less than -100 dB, 20 Hz to 20 kHz

Dynamic range: Compressor out > 128dB

Compressor in > 110dB

6.4. Servicing and repair

There are no user serviceable parts inside this unit.

Repairs should only be undertaken by qualified electronics technicians or engineers.

6.5. Mains transformer voltage selection

The mains transformer has a tapped primary to allow operation at nominal voltages of 115V or 230V. Ensure that the correct voltage range is selected before using the MLA-2.

6.6. Fuse

There is one mains fuse, accessible externally in the IEC320 mains inlet. If this fuse is blown it should be replaced by a similar value and type.

20x5mm 250V 315mAT (antisure, slow)

6.7. Earthing

The unit has an internal link connecting the audio ground to the chassis. A chassis earth stud is provided on the rear of the unit.

6.8. Physical dimensions

Weight: (10lb) (5kg)

Width: 19 inch (483mm) rack-mountable

Height: 2U (90mm)

Depth: 10.25 inches (260mm) add clearance for connectors

7. ELECTROMAGNETIC COMPATIBILITY

This equipment is intended for use in an electromagnetically controlled environment.

To maintain the performance specification it should not be subject to strong magnetic fields (such as in the immediate vicinity of a power amplifier or cathode ray tube)

This equipment does not include digital circuitry or generate high frequencies that could be radiated or conducted from the unit.