

TRILEVELER

User Manual

TriLeveler Voice Processor



Use Loudness Curve ☐

Show Internals ☐ HARD LIMIT @ -6.0dBfs

MICRO DYNAMICS



MEDIUM DYNAMICS



MACRO DYNAMICS



-20 -12 -6 0 6 12 20

GATING 3dB

LIMITING 0dB

OUTPUT: -26.1dB

TABLE OF CONTENTS

1. *Introduction*
2. *Input Trim*
3. *Target*
4. *LF & HF Cut*
5. *Expander Gate*
6. *Headroom & limiter*
7. *Output Trim & output level meter*
8. *Use Loudness Curve*
9. *When to use loudness curve?*
10. *Show Internals*
11. *Micro Dynamics*
12. *Medium Dynamics*
13. *Macro Dynamics*
14. *The Min & Max Sliders*
15. *Getting started with TriLeveler*
16. *Current caveats and pitfalls*
17. *License*
18. *Signal flow diagram*

1. INTRODUCTION

TriLeveler is a "non-real time" signal leveler for speech broadcasting. It operates with latency of about 800ms. This is the trade-off for quality it offers for maintaining target level with minimum audible artefacts. Your host should handle the latency compensation automatically.

TriLeveler offers three RMS driven dynamics sections chained in series. Each section has a slightly different purpose in the chain. When signal progresses from section to next, it becomes more and more compressed and tied to the target level.

2. INPUT TRIM

The *Input Trim* adjusts the level of program material entering TriLeveler. It is used for adjusting optimal levels before the leveling process. Input Trim operates within +/- 20dB range. See chapter 15 about the optimal input level.

3. TARGET

The *Target* slider sets the operating target you wish your output level to be. The default value is -26dB^[rms]. Even though TriLeveler does not operate in EBU R128 domain, the default value of -26dB is suitable to get EBU R128 compatible output stream with voice material. Please note that the target represents an RMS value, thus setting it too high will lead to compression artefacts.

4. LF & HF CUT

These sliders adjust the LF & HF cut frequency. Filtering is applied into program material before entering into the leveler. When the HF Cut is set to 22000Hz, it actually means that the filter is bypassed. However, the LF cut is always active with the value represented on the slider.

It is generally a good idea to filter out such frequency ranges that are not relevant to the material.

5. EXPANDER GATE

The [Expander Gate](#) slider adjusts the threshold point of the expander. The ratio is automatically calculated based on the current input level. The expander gate tries to act "intelligently" so that even high threshold values should not cause too much problems.

It is advisable to adjust the expander threshold slightly above of the noise floor of program material.



There is an indicator when the expander gate is active. If you see it starting to blink orange or red, it indicates that there is excessive amount of gating going on and your program material may be compromised. In such cases it is advisable to lower the threshold value.

6. HEADROOM & LIMITER

The [Headroom](#) slider manages how much headroom is allowed on top of the output target value. This setting operates in dB^{peak} units. Everything that is going over the headroom will be hard-limited. The maximum peak signal that TriLeveler passes can be calculated with an easy formula: $\text{Target}^{\text{dB}} + \text{Headroom}^{\text{dB}}$. The very first row on the metering panel will tell you that value without need for you to do the math. The hard limit point never goes over -0.1dBfs.

There is also a limiting indicator which will tell how much of limiting is currently occurring. Under normal conditions you should set the headroom so that the limiter indicator will be active only occasionally.

7. OUTPUT TRIM & OUTPUT LEVEL METER

The [Output Trim](#) adjusts the final output of program material. It has a range of $\pm 6\text{dB}$. In the metering section there is an output level indicator which will show the final RMS output value of the program material. It operates with very slow integration time of 5000ms. The output level meter is not updating when the

expander gate is active. The color of the output level readout will change to blue when current output level is less than the target value. Red represents that the target has been exceeded. It is normal for the output level to fluctuate slightly.

8. USE LOUDNESS CURVE

The *Use Loudness Curve* button engages a special filter that changes the leveler section to be more sensitive to how human ear hears audio. Basically this means that audio is not leveled exactly to the target level, but varies slightly depending on the spectral content of the program material.

9. WHEN TO USE LOUDNESS CURVE?

The need for loudness curve is probably not very common. You might need it if one of the following conditions is met:

- Your material has several varying quality of sources. For example this would be a person in studio who is talking with another thru a crappy phone line.
- In some cases the loudness curve may be beneficial if there is female and male voices mixed.

When using the loudness curve, you may need to adjust your output trim to have the average of your material in desired target range.

10. SHOW INTERNALS

The *Show Internals* button opens a panel where you can adjust the operating parameters of the three levelers. In the next chapter those parameters are explained in detail.

11. MICRO DYNAMICS

The Micro Dynamics section will handle all fast transients, like sharp consonants, plosives and beginnings of loud words. It will reduce the burden of the following sections. The Micro Dynamics section operates with 50ms integration time.

12. MEDIUM DYNAMICS

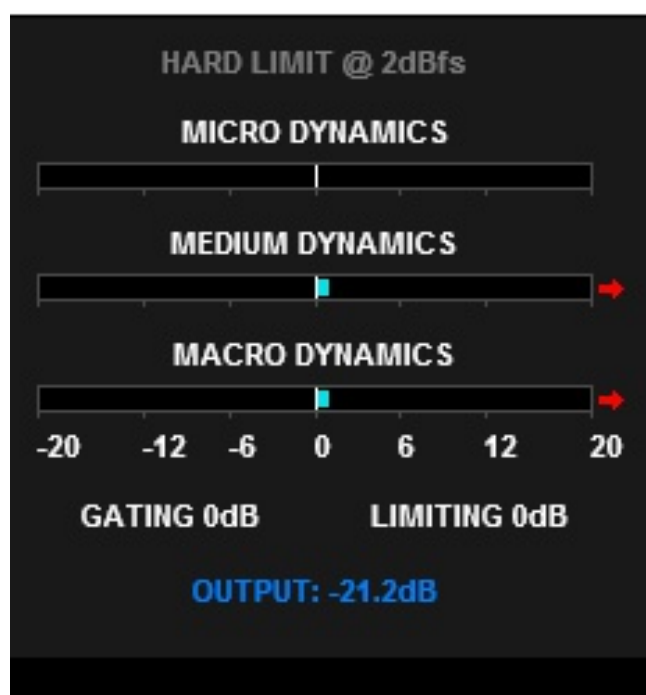
The Medium Dynamics section basically handles the body of speech. It is probably the most effective of the three sections in terms of leveling. The Medium dynamics section operates with 500ms integration time.

13. MACRO DYNAMICS

The Macro Dynamics section is the final phase in the leveling process by making small adjustments to the already processed signal. This section usually doesn't do more than few decibels in the way or another - basically what is left from the previous sections to be done. It reacts slowly, with 2000ms integration time.

14. THE MIN & MAX SLIDERS

The Min & Max sliders in each dynamics section controls the amount of dB's that Trileveler is allowed to alter the program material dynamics.



There is comprehensive metering for all three dynamics sections. It is easy to see how much gain or attenuation is being applied by each section.

If you see a red or an orange arrow blinking on the side of the dynamics meter, it suggests that you need to adjust the min or max values of that section. In this example, the medium and the macro dynamics would need more gain (the Max slider) to be able to reach the intended target output value.

Alternatively you can just adjust the input

trim to feed hotter or quieter signal into TriLeveler.

15. GETTING STARTED WITH TRILEVELER

TriLeveler may seem a bit complicated at the beginning. But you might begin to notice how little tweaking it needs, after all. The default settings of TriLeveler are very good starting point which may suit to most of the material you throw into it. Just set your target level and check the input trim.

*As a rule of thumb, it would be a good practice to adjust the input level of your program material so that the **medium dynamics meter** will be jumping both above and below zero level during louder and quieter periods.*

If you require absolute transparency, you might consider reducing the Micro & Medium Dynamics min/max values and let the Macro Dynamics do most of the work. Of course this will also make the output material less compressed, hence more variation around the target level.

16. CURRENT CAVEATS AND PITFALLS

– As TriLeveler operates in a high latency mode, the metering section does not display what you are hearing just now. Instead, it displays what you are *going to* hear within next second. Syncing the meter into actual output would require more CPU resources due to the additional delay lines. I decided it is not worth it (at least for now). Although it might make visualizing the operation more difficult - and in some extreme cases even cause making wrong decisions when setting up TriLeveler. This is just a note to be aware of. Always use your ears as the final source of judgement.

– TriLeveler is a mono plugin in it's core, although it will process and pass stereo information. This means that all the detectors operates with combined L & R. If you need a true stereo operation, you can achieve it by using two TriLevelers, one for each channel. But the downside is that there will be no stereo link between the instances, which means the stereo image might get unsteady.

– Every time when you start playback, TriLeveler needs a moment to stabilize to the target level.

Thanks for using TriLeveler!

17. LICENSE

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18. SIGNAL FLOW DIAGRAM

