RC AUDIO LEVELIZA RC1 Sound System User Manual

LEVELIZA
User Manual – April 2023

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LEVELIZA RC1 Sound System

If you have just purchased a LEVELIZA then thank you very much for doing so, and I do hope you enjoy the benefits of using this new and revolutionary product.
Best regards, Jon and the RC Audio Systems team.

Application of the LEVELIZA

The LEVELIZA is intended to be inserted into a full range audio signal. When the average perceived loudness of the signal exceeds the threshold set on the LEVELIZA, the unit will gently attenuate and “ride the gain” to try to maintain the average perceived loudness around the threshold level. In this regard the LEVELIZA is a unique device, and the only simple plug and play solution to achieve a consistent average level throughout an event from an inconsistent source (such as a DJ) without need for an engineer to ride the gain throughout the event and without the compromises in performance and dynamic range associated with other limiter/leveller/compressor/AGC options. The LEVELIZA is not a limiter. It will not protect amplifiers or speakers from clipping/overload, and system limiters should still be used as normal to offer such protection. The LEVELIZA is not a compressor, it will not compress, expand or otherwise affect the dynamic range of the music signal, it just slowly rides the gain with the objective of trying to maintain a consistent average perceived volume level over a period of time. Because the LEVELIZA is only interested in the perceived loudness of the music, it is not as concerned with low bass and sub frequencies as these have less affect on our human ear’s perception of loudness than the other frequencies. For this reason the LEVELIZA is not suitable for use in controlling low bass & sub frequencies.

Features and Controls

The LEVELIZA has two independent channels, and each channel has just three controls.

- The first control is “input gain” that can be used if desired to manually attenuate the input.
- The second control is to set the “threshold” for the desired maximum output level.
- The third control is the “assertiveness”. This control would usually be set to minimum in normal use, in which case the unit will consider the average perceived volume levels over a few minutes and try to work at an inaudible rate to correct the levels as necessary. On occasions where the threshold level is being set/ascertained/calibrated, or if large fluctuations in level between different music sources are expected, the assertiveness can be turned up high and the unit will work much faster to maintain the correct perceived volume levels. The engineer also has the flexibility to choose a level of assertiveness in between if it is considered beneficial to a particular application.

In addition to its normal subtle operation the LEVELIZA will automatically work much faster for an “emergency

response" in cases where the music is suddenly turned up considerably over threshold. It really is designed with the purpose of continuously managing the perceived volume levels just the same as a good human engineer would. There are two displays, one for each channel, and they simply indicates the approximate db of gain reduction that is currently being applied to that channel. TAMPER PROOF:- Also, for applications where the engineer does not want the threshold level to be increased there are additional hidden tamperproof adjustments that can be set to limit the maximum output threshold.

Connections

Mains power is connected via a standard IEC cable into the rear of the unit. Audio inputs – there is an XLR input for each of the unit's two channels. The unit is designed to operate at standard "line" levels. Audio outputs – there is an XLR output for each of the unit's two channels.

Guidance for set up and use

Of course there are many situations in which a LEVELIZA may be found useful, and in that regard the user will need to use their judgement in how to best deploy the device. However, probably the most welcome use of the LEVELIZA is for maintaining consistent levels at a venue or throughout an event where DJs are performing and there is considerable inconsistency between the levels produced by the various DJs throughout their sets. For this reason I will provide some guidance on how we would suggest deploying and using the unit in this situation, as follows:-

Connection
Probably the best way to connect the LEVELIZA is to insert it between the DJ mixer and the PA desk/sound system, although it could be put elsewhere in the chain if necessary.

Adjustment of the unit
Initially the displays should read "000".

1. We always start with all the control knobs of the LEVELIZA turned up fully clockwise. In this position, unless there is a really hot signal, the unit remains inactive and the signal can pass through freely.
2. Once the music signal is present and the desired level is reached slowly turn down the threshold knobs until the displays reads "001". This means the level is now just 1db over threshold and so the LEVELIZA is attenuating the signal by 1db. If the threshold knob is left in this position the LEVELIZA will try to hold the average perceived volume around this level regardless of how much the input signal is increased further.
3. The LEVELIZA is still on maximum assertiveness, so will work hard to respond quickly to maintain the level. However, in order not to affect the dynamics of the music throughout the performance a much slower and more relaxed response is required. To achieve this the assertiveness controls should now be turned right down to "low (normal)" and then the unit can be left alone to engineer the gain as required, so that the average perceived level of the event will not exceed the threshold.

We normally leave the "INPUT GAIN" attenuator all the way up all the time, but in case of a very high signal level it can be used to reduce the input if required.

Are there any special procedures for adjusting the levels or threshold during an event?
When adjusting the threshold or input gain during an event there will be a time lag before realising the full result of the adjustment. This is because the LEVELIZA works on average data over significant periods, especially when the assertiveness is set low for normal operation. For this reason you should temporarily turn the assertiveness to "high (calibration)" whilst carrying out adjustments as then the results can be fully assessed within only a few seconds, then once you are happy with the new levels and threshold the assertiveness should be turned down again for normal operation.

What if the DJs produce a level below the threshold?
In that case the unit will stop attenuating and the level at the event will become reduced accordingly. In cases where this reduced level is unacceptable and a consistent level is required, even if the DJ plays below threshold, then the LEVELIZA should be set so that it is attenuating more heavily and therefore the DJs can reduce the signal more before the LEVELIZA stops attenuating. This can be achieved during the setup above by setting the input gain knobs back to perhaps 1 or 2 o'clock in step one, instead of all the way up. Then, in between step 2 and 3 turn the input gains all the way up. The LEVELIZA should quickly correct this additional level with some additional attenuation.

What if the LEVELIZA is attenuating a lot, maybe 10 or more db?
The sound quality and performance of the LEVELIZA is not affected by the amount it is attenuating. If the event is sounding good it doesn't make any difference if the LEVELIZA is working at 3 or 5db of attenuation or at 20db. The only significance of a high attenuation is that the DJs would need to then reduce their levels a lot more before the event became quieter, and depending on the requirements of the event this might be either a good or a bad thing.

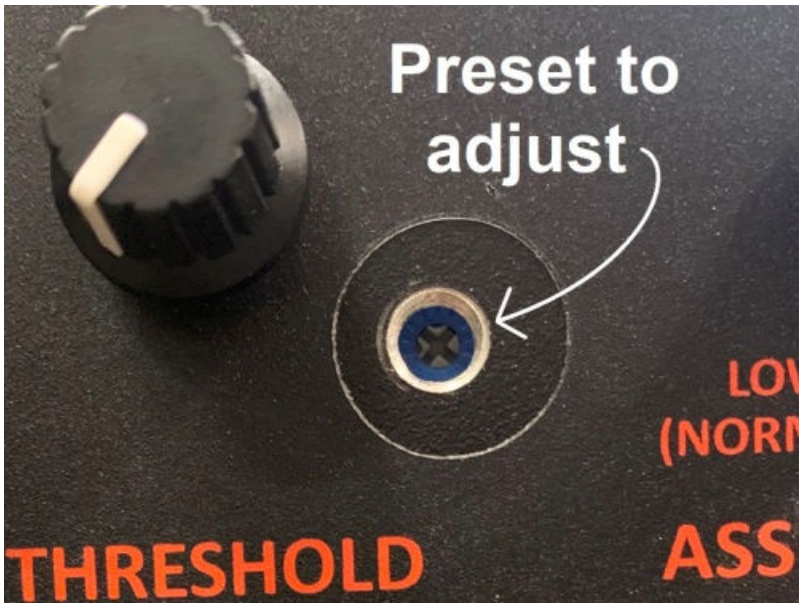
In what situations would you increase the assertiveness?
If there is a large and sudden fluctuation in operating levels, perhaps a change of DJ or music source, then with the assertiveness in the normal "low" operating position the LEVELIZA would take some time to recalibrate. In such situations it can be beneficial to increase the assertiveness temporarily to the "high (calibration)" position until the large fluctuations/changeover have passed so that the LEVELIZA works fast to re-calibrate itself and maintain the levels consistently throughout the changeover.ne example we have experienced is when a new DJ has pointed out that the DJ mixer is operating well into the red and they would like to bring it back to correct levels, but want us to cooperate by bringing the system gain back up to match at the same time. In this case we've turned up the assertiveness, they've then gained back by 10db and the LEVELIZA has quickly reduced its attenuation by 10db to match, then we put the assertiveness back to "low (normal)" again. Without turning up the assertiveness in this situation the LEVELIZA wouldn't know that the sudden reduction wasn't deliberately part of the show, therefore it would take a lot longer to release its attenuation.
Also, if the music source is unusually inconsistent in level and a more consistent output level is desired then the assertiveness could be increased so that the LEVELIZA worked harder and faster to maintain the level. As with many things in life, there is always a trade off to consider. A higher assertiveness will work harder to keep a more consistent level, but at the expense of the dynamic range of the show as it could to some extent spoil music by ironing out the level differences between the louder and quieter sections of a piece of music. Equally if the assertiveness was too low then it wouldn't perform well enough at maintaining the show at a consistent average level. Following many trials we've set the LEVELIZA's "low (normal)" assertiveness to be about the optimum assertiveness managing the levels at most events or in most situations, but of course there will be times, including as mentioned above, where a higher assertiveness is beneficial.

Tamper Proof threshold adjustments

In some situations where a sound system is to be left unattended, or maybe in an installed venue, the engineer that carefully set the threshold levels may not want anyone else to adjust these levels in their absence. For this reason there are some hidden adjustments that can be set on the LEVELIZA. Just adjacent to the threshold knobs there are holes in the front panel. These holes are tapped with a standard M6 thread, and when we supply the LEVELIZA we cap these holes off with a very short "black M6 dome socket cap screw". If these screws are removed (with a small allen key) then a preset adjustment can be found inside. The presets, as supplied, are turned fully clockwise into their off position. To set these tamper proof thresholds:-

1. Turn the threshold knobs all the way up – this is important,
2. then (with music playing at desired threshold volume) using a tiny cross head screwdriver turn the preset threshold adjustment slowly anticlockwise until the LEVELIZA starts to attenuate, and hence set the thresholds as required. SEE BELOW PHOTO OF THE PRESET LOOKING IN FROM FRONT. BE CAREFUL NOT TO PUSH OR FORCE THE PRESET AS IT IS FRAGILE.
3. Put the security screws back in so that nobody can access the presets.

Once this is done the front panel controls are still fully operational as normal, however the maximum threshold and hence maximum average volume level that the LEVELIZA will allow to pass to the sound system is restricted to the levels set on the presets.
There are many different security screws and other screws that require special screwdrivers/tools available on the market with an M6 thread, so to increase security further the owner can buy their own unique screws to use instead of the supplied ones cover the presets. However, the threaded length must not be more than 4mm or there is a risk of damage to the preset and/or circuit board behind the front panel. Of course longer screws can be bought and carefully cut down to under 4mm.



Specifications

Dimensions:	Standard 19 inch 1U rack case by 250mm deep
Weight:	Approx 3kg
Power requirement:	90 – 264 V AC, 47 – 63 hz, up to 60mA current draw
Audio Connections on rear:	XLR input and output for each channel
Power Connections on rear:	Standard IEC power inlet
Typical input level:	Designed to be compatible with “line level” pro audio equipment
Maximum input before clip:	Unbalanced 10V RMS / Balanced 20V RMS
Display:	Approx gain reduction shown in db for each channel

Warranty

The LEVELIZA comes with a five year full parts and labour warranty, during which time we will repair any faults if they should develop affecting the performance of the product. This warranty does not cover damage caused by misuse or abuse or tampering with the products.
After the warranty has expired we will continue to support the products into the future, including offering a repair facility, spare parts and technical support should any customers need any assistance.

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Documents / Resources

	**RC AUDIO LEVELIZA RC1 Sound System** [pdf] User Manual LEVELIZA RC1 Sound System, LEVELIZA, RC1 Sound System, Sound System

References

- **User Manual**