

The Fitness Audio Loudness Monitor LM-30 'The Trigger'TM

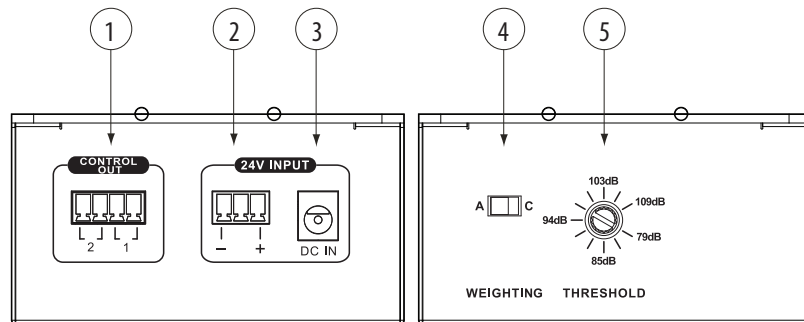
Thank you for purchasing the The Trigger LM-30 Loudness Monitor by Fitness Audio. The Trigger is an SPL (Sound Pressure Level) measuring device, made for and marketed by Fitness Audio. The Trigger provides the answer to the "How Loud is too Loud?" question for all Fitness Club Managements. Sound levels will vary from instructor to instructor, with different class styles and the total number of bodies in the studio at the time so sometimes the system has to be pushed harder for a full class but a lot less so when there's only a handful of people attending. White dots on mixers and amplifiers to show "max volume settings" are a pointless exercise, the only sure way of knowing where you are with regards to sound levels is to have a simple continuous visual guide which is what Trigger does.

If you have purchased The Gov^nor with The Trigger then make sure The Trigger is mounted on a wall at least 3-5 metres away from the nearest speaker, or between speakers on a side wall and at least 2.5 metres off the floor – out of the direct line of fire of any speaker. In this position it can measure the ambient SPL Level in the room with a reasonable degree of accuracy. Most legal definitions of Exposure to Noise in the Workplace list 94dBA as the recommended level for a 60 minute exposure. In the case of a Group Exercise class "Noise" is a combination of the amplified Instructor's Voice mixed over their choice of fitness music.

This product is best installed by someone qualified in setting up and adjusting it in conjunction with an SPL Meter or with The Gov^nor Sound Pressure Limiter SPL2.2 or the Aeromix 2+2 Mic/ Line Mixer also from Fitness Audio. The Trigger can also be a stand alone Loudness Level Display, if this is the case then it should be supplied with the optional extra 24V Power Supply.

1. Powering It Up As A Stand Alone Loudness Monitor

Select a position on a side wall between speakers about 2.5m off the floor at a position where it can be connected to electrical power from a socket in or near the ceiling. Decide if you want to hang it vertically or horizontally. There are 2 cross holes on the back that allow you to hang it either way off of one (Vertical) or two (Horizontal) screw heads. Connect the 24V Powerpack to the socket and the DC Connector to the DC IN socket on the top edge of the Trigger. The 2 green -ON- LEDs will light up.



Rear Panel Illustration

2. Powering It from The Gov^nor SPL2.2 Limiter

Prepare The Trigger for wall mounting as above. If connecting to the SPL2.2 Limiter then you can use Cat 5 Cable or a length of speaker cable to power it from the green 3 pin Molex Connector on the back panel of the Gov^nor. If using Cat 5 cable Pin 1 is earth and Pin 3 is +24V at both ends. Use the Green and Green/White pair for this, with the solid Green as the earth cable to Pin 2 at both ends. Once connected the Trigger will power up when the Gov^nor is turned on.

3. Connecting the Control Signal to The Gov^nor SPL2 or SPL2.2 Limiters or Aeromix 2+2 Mixer

If using CAT 5 Cable use the Orange & Orange/White Pair. Trim back the 2 unused pairs of cables. This time we are using the green 4 pin Molex Connector at each end so strip back about 10cms of cable jacket so that the 2 used cable pairs can separate for both Molex plugs on the SPL2.2. Make sure you connect up to the same terminals at each end to the 4 pin Molex Connector, the Earth (-) or Ground side of the cable is connected to the inside contact of Control Pair 1 of the Gov^nor, on the right hand side of the Molex connector. It is the same for the Trigger - use the solid Orange as the earth cable and the Orange/White for the Control signal. This also can be done using another length of standard Speaker cable.

4. Plug it in!

Once wired, plug all the Molex connectors in and turn on the Limiter and the sound system. Refer to the Operation Manual for the Gov^nor and the Aeromix for setting them up the way you want it.

5. A vs C Weighting

*A-WEIGHTING follows the frequency sensitivity of the human ear at low levels. This is the most commonly used weighting scale, as it also predicts quite well the damage risk of the ear. Sound level meters set to the A-weighting scale will filter out much of the low frequency noise they measure, similar to the response of the human ear. Noise measurements made with the A-weighting scale are designated dBA.

*C-WEIGHTING follows the frequency sensitivity of the human ear at very high noise levels. The C-weighting scale is quite flat, and therefore includes much more of the low-frequency range of sounds than the A scale.

In a practical sense A Weighting responds slower than C Weighting as far as the LEDs are concerned because it is a flatter curve recording more bass energy, so if your major concern is complying with orders to reduce excessive bass use the C Weighting, but if your primary concern is to comply with the standard Occupational Health & Safety exposure of 94dBA for a one hour class then use the A weighting position of Switch (4)

6. Adjusting the Threshold Level

The Trigger comes pre-set at the centre click position or 94dB. If you want to change this setting then using a small slot head screwdriver insert in the top of this 11 click rotary pot and count it up or down at 3dB per click position. You can go up or down 15dB from the centre spot. Most agencies in North America, Europe and Australia/New Zealand agree that

94dBA is the reference point for an hour of noisy work before people's hearing starts to suffer damage over time. The other marked levels are 85dB which is the recommended level for background music and noise for an 8 hour working day at the place of work and 103dBA is there to remind you that your ears could be damaged if this level is maintained for longer than 7.5 minutes! Once set insert the rubber plug in the hole as a set and forget exercise.

7. The Trigger Loudness Monitor

If you are using the Trigger to control the Gov^nor then follow these instructions but if you are setting it up manually using an SPL meter refer to section 8.

7.1 Setting the upper limit

Switch the Limiter Switch (7) to ON and the Control switch (1) to ON once The Trigger is connected and turned on. Now set The Trigger's Threshold Control to the recommended level of 94dBA and preview with the live mic and music. When the volume reaches the level of 94dBA the red LEDs will illuminate and a voltage control signal will trigger the Limiter to start working. The object of the exercise now is to mix to the top 3 yellow LEDs with the 94dB level as the top limit using the limiter to put the brakes on it going louder than that.

7.2 Setting the Gov^nor's Controls

There are 3 coloured control knobs that need to be adjusted by trial and error so use your ears. The first is the red knob marked Peak Level Reduction (9) which determines the amount of limiting (gain reduction) that needs to be applied to the signal – ie the harder the system gets driven the more to the right you should turn it!

Next is the yellow knob marked Limit Threshold (10) – this adjusts the volume ceiling up and down and determines how much of the signal gets the limiting treatment.

Finally the green third knob Meter Trim (11) controls the LED output display on the front panel and is independently adjusted so that it can always have an 'in the red' presence, if that's what management want their staff to see.

The Response Time (8) adjusts the time (from 2 to 8 seconds) between when The Trigger's red lights come on and the Gov^nor starts limiting the audio level. This will allow a few words of amplified encouragement through before the limiter cuts in and clamps down on their voice.

As we said this needs to be set up by trialling it to find the best settings that work best for the client.

Once it's working correctly then the users will be turning the music up to light up the yellow lights on The Trigger with the red lights coming on only occasionally when the instructors voice is raised. If the red LEDs are lit continuously at the Threshold Setting then this will 'trigger' the Limiter to cut in and hold the level at the threshold setting and a clicking sound can be heard as this happens. Just back off the Voice and/or Music controls a touch to get the red LEDs flashing only on short sharp peaks not permanently and that's where the sound level should be.

NB The Gov^nor SPL2.2 will also work in a similar way when connected to SoundEar[®] Products @ www.soundear.dk

8. Training the Trainers

The team of instructors using this new setup will have to be advised on how to use it effectively and avoid the limiter cutting in but they will be achieving an SPL in the room that's closer to the standard for healthy hearing – not just for the attendees but also themselves. In today's legal parlance, it's all about the Club Management's 'Duty of Care' to Staff and Members. With practice the Instructors/DJs will learn to mix the music volume up so that the orange LEDs light up solidly (@92dB) with only occasional red showing. However, if the red lights trigger the limiter or the mute circuit in the 2+2 Mixer then both the Music Volume and the Voice Volume Controls need to be edged down so that it doesn't repeat.

NB. The advice given above is as a guide only and should be double checked for average accuracy by using a handheld SPL Meter from time to time to confirm that the average sound pressure levels in the room match the suggested settings. No responsibility is claimed by the manufacturer, marketers or suppliers of either the Fitness Audio SPL2.2 or The Trigger if the guidelines require correction. Please check your own regulated OH&S rules for the advised sound levels and work with them.

9. Lock it Up!

Once The Trigger and The Gov^nor are set up and working to your satisfaction, use the supplied control panel cover with a pair of wire seals (available from electrical suppliers) to ensure tamper-free operation.

*A vs C Weighting Statements lifted from <http://www.hearforever.org/tools-to-learn/sound-source-a-and-c-weighted-noise-measurements>

Fitness Audio products are distributed worldwide by Fitness Audio Network. They are manufactured to our specifications. Your Fitness Audio Loudness Monitor is covered against manufacturing defects by a 12 month warranty commencing at the date of purchase.

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Warranty information for service claims.

(Please retain for your records.)

This product was purchased by:

(Business Name).....

on (date) .. / .. / .. from (Supplier)

of (address)

Serial Number

WARNING	CE	RoHS CONFORM
		FC
Do not remove lids No user serviceable parts inside Do not place liquid containers on unit Do not expose to moisture or rain		

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THE TRIGGER

LM30 Loudness Monitor



Operating Manual