

**ASM-2 — Seven-Range Sound Level Meter****INTRODUCTION**

Congratulations on your purchase of the Nady ASM-2 sound level meter. You'll find that it is an extremely versatile device for measuring sound intensity in just about any acoustic environment—loud or soft; high-pitched, low-pitched, or broad-band; intermittent or continuous. You can use it to measure noise levels in factories, schools, offices, and airports, or to check acoustics of studios, auditoriums, and home theater installations.

Your meter features a large, easy-to-read indicator for taking quick measurements anywhere. Power is supplied by a 9-volt alkaline or NiMH battery, so the meter is completely portable.

The meter's other features include:

- Seven sound-level ranges—allow measurements from 50 - 126 dB (referenced to 0.0002 $\mu$ bar).
- A and C weightings—lets you check compliance with safety regulations as well as make acoustic analysis.
- Slow and fast response settings—let you check peak and average noise levels.
- Built-in battery condition indicator
- Phono-type output jack—for connection to home theater or test equipment.
- The Threaded insert—lets you attach the meter to a camera tripod for increased accuracy.

**INSTALLING A BATTERY**

The meter uses a 9-volt battery. For the longest life and best performance, we recommend an alkaline battery. Open the battery compartment cover by pressing both sides at the lower striped portion and lifting the bottom. Insert a battery into the compartment as indicated by the polarity markings (+ and -) marked inside.

To test the battery, set RANGE to BATT. If the meter shows a reading in the red BATT TEST region, the battery is still good.

Notes:

- Leave RANGE in the OFF position when the meter is not in use to conserve battery power.
- Remove the battery if you are not going to use the meter for a week or more.

**RANGE**

The RANGE selector lets you select one of seven sound level ranges, each spanning 16 dB. The numbers on RANGE refer to the center points of the seven ranges. The needle indicator shows the actual sound level as a displacement from the center point. For example, if RANGE is set to 80 and the meter scale reads -3, the actual sound level is 77 as the value where RANGE is set, the actual sound level is 80 dB (80+0).

**OUTPUT**

The phontype OUTPUT jack lets you connect the meter to recording or other measurement equipment. For example, you might use an audio patch cord to connect the meter to the AUX or high-level input of a recorder. Note that the meter response will not be flat, due to the A- and C-weighting networks. Set Range so the maximum needle deflection is never greater than +4, to prevent the built-in amplifier from clipping. Use A-weighting for voice recordings, or C-weighting for full-range musical material. The OUTPUT jack can also be connected to high-impedance headphones, or an oscilloscope, a frequency analyzer, or other test equipment.

**RESPONSE**

The RESPONSE selector has two settings: FAST and SLOW. In the FAST position, the meter reacts quickly to changes in the sound level, showing you the peak sound levels present in the environment. In the SLOW position, the meter is damped and indicates an average-value sound level. The effect of brief sound peaks is minimized in this position.

**WEIGHTING**

Set WEIGHTING to weight the sound measurement for a particular frequency range. When set to A, the meter primarily measures frequencies in the 500-10,000 Hz range, which is the area of greatest sensitivity to the human ear. When set to C, the meter measures uniformly over the frequency range from 32-10,000 Hz, giving an indication of the overall sound level.

**MICROPHONE**

The meter's built-in microphone works best when you point it directly at a sound source.

**TRIPOD ADAPTER**

You can mount the meter on a camera tripod (standard 1/4-20 thread) to eliminate hand noise and minimize the effects of sound reflected from your body. This makes it easy to use the meter with auxiliary recording or test equipment.

**CAL(CALIBRATION)**

Your meter has been accurately calibrated at the factory and normally will not require further adjustment. If necessary, an audio professional can use the CAL hole on the meter with special equipment, including a sound generator, to calibrate it.



## **MAKING MEASUREMENTS**

### *Important:*

- Do not hold the meter directly between you and the sound source, as this might produce an error of several decibels in the frequency range above 100 Hz. Position the meter so an imaginary line between you and the meter is perpendicular to a line between the meter and the sound source.
- Handle the meter carefully. The microphone and meter movement are fragile and might be damaged if the instrument is dropped. Do not operate the meter at a range setting that causes “pegging” of the needle. This could damage the sound levels.

Follow these steps to select the desired response, weighting, and range.

1. Set RESPONSE to FAST if the sound source you want to measure consists of short bursts or if you want to measure only peak values. Or, set RESPONSE to SLOW if you want to measure average sound levels.
  2. Set WEIGHTING to A if you want to measure noise level or C if you want to measure sound levels of musical material.
  3. Set RANGE to the highest setting(120 dB)then adjust it downward until there is significant deflection of the needle.v for the greatest accuracy , always use the lower of any two possible settings.
- For example, if RANGE is set to 80 dB and the meter reads around -5 , reset RANGE to 70 dB so the meter reads +3,for an actual sound level of 73 dB.

*Important: For meaningful readings, any particular sound to be measured must be at least 10 dB louder than the background noise level.*

While taking measurements, minimize the effect of your body's presence. When the sound is coming mainly from one direction, the level reading might be significantly affected by reflections from your body. For the most accurate readings and the best polar response, point the meter's microphone toward the sound source when possible.

## **CHECKING NOISE LEVELS**

This chart, gathered from Federal, state, and local agencies, shows standards for just how much noise is acceptable.

Noise is inevitable in almost any environment. Depending on the level and duration, noise can be a minor irritant, a definite disturbance, or even a threat to your hearing.

To use your meter to check noise levels, set WEIGHTING to A and RESPONSE to SLOW. Take measurements at several points in the test area, with the meter positioned properly.

| Sound Level (dB)<br>(A- Weighting, SLOW<br>response) | Maximum Duration<br>Per Day(hours) |
|--|------------------------------------|
| 90   | 8                                  |
| 92   | 6                                  |
| 95   | 4                                  |
| 97   | 3                                  |
| 100  | 2                                  |
| 102  | 1 1/2                              |
| 105  | 1                                  |
| 110  | 1/2                                |
| 115  | 1/4 or less                        |

*Permissible noise exposures.Extracted from U.S.  
Department of Labor Noise Regulations.*

## **CHECKING ROOM ACOUSTICS**

The size, shape, and furnishings of a room can have a tremendous effect on a home theater system's performance. A “hard” room with bare surfaces tends to exaggerate treble response, sometimes giving the music a strident quality. A “soft” room with curtains, over-stuffed furniture, carpet, etc. might reduce high-frequency response so the bass sounds dominant, giving you a “mushy” sound. Dewaves might also develop in the room, giving your system a “peaky,” eccentric response.

The first step in solving this problem is to analyze the room's acoustics with your meter and a suitable test recording. The test recording should produce pure tones, one at a time, at intervals spanning the audio spectrum. Make a graph or table showing the sound levels generated by the individual tones. This gives you a clear idea of the frequency response of your “total system” —home theater equipment and room included.

The next step is to smooth out the reponse. Adjusting tone controls and varying speaker placement might improve the sound significantly. But, to approximate the ideal, “flat response,” you could add a frequency equalizer to your home theater system. Frequency analyzers, such as the NADY GEQ Series graphic equalizers or the PEQ-5B parametric equalizer, let you boost or cut response in different ranges, as indicated by your frequency response analysis. Properly equalized, your system can sound like one costing considerably more!

*Note: If WEIGHTING is set to C, the meter's frequency reponse is flat from 32 to 10,000 Hz ((3 dB). Above 10 kHz, the frequency response of the meter drops off rapidly. Besure to consider this when you use a test recording that includes tones at the extreme high end of the audio spectrum.*

## **SPECIFICATION**

### **Range:**

| Switch Setting | Range of Measurement |
|----------------|----------------------|
| 60 dB          | 50-66 dB             |
| 70 dB          | 60-76 dB             |
| 80 dB          | 70-86 dB             |
| 90 dB          | 80-96 dB             |
| 100 dB         | 90-106 dB            |
| 110 dB         | 100-116 dB           |
| 120 dB         | 110-126 dB           |

**Load Impedance:** 10 kohm minimum

**Distortion:** Less than 2% at 1 kHz, 0.5-volt

**Microphone:** Electret condenser omnidirectional becoming slightly directional with increase in frequency

**Battery:** One 9-volt rectangular type

**Accuracy:** ±2 dB @ 114 dB

**Standard:** 0 dB = 0.0002 µbar

**Weighting:** A and C

**Response:** Fast and Slow

**Signal Output:** 1.0 volt (peak) minimum into open circuit, with full-scale meter deflection at 1 kHz

**Battery Check:** Tests “good” from 7.0 To 10.5 volts

**Expected Battery Life:** 110 working hours (alkaline battery)

**Size (HWD):** 6.25” x 2.43” x 1.75” (160 x 62 x 44 mm)

**Weight:** 6.6 oz (about 185 grams)

Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.

## **SERVICE**

**(U.S.)** Should your Nady ASM-2 Sound Level Meter require service, please contact the Nady Service Department via telephone at (510) 652-2411 or e-mail to service@nady.com for a Return Authorization (R/A) Number and a service quote (if out of warranty). Make sure the R/A Number is clearly marked on the outside of the package and enclose a cashier's check or money order (if not prepaid with a credit card). Ship the unit prepaid to: Nady Systems, Inc., Service Department, 6701 Shellmound Street, Emeryville, CA 94608. Include a brief description of the problems you are experiencing.

The warranty card enclosed with this system contains additional valuable warranty and service information. Keep it in a safe place for future possible reference. Do not attempt to service this unit yourself as it will void the warranty.

**(International)** For service, please contact the Nady distributor in your country through the dealer from whom you purchased this product.