User's Manual

Digital Sound Level Meter

Model 407768

Introduction

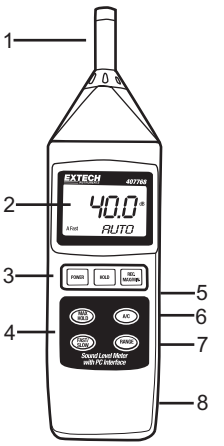
Congratulations on your purchase of the Extech 407768 Sound Level Meter. This Auto Range Sound Level Meter meets ANSI and IEC Type II accuracy standards. Professional features include programmable Frequency Weighting and Time Response, Min/Max Memory, Max Hold, Analog output, and RS-232 PC Interface. Careful use of this meter will provide years of reliable service.

Specifications

Display	5 Digit LCD with overload, low battery and multifunction indication
Frequency bandwidth	31.5 Hz to 8 KHz
Microphone	0.5” Electret Condensor Microphone
Output terminals	Optically isolated RS-232 port and AC output
Measurement ranges	Auto Range: 30 to 130dB Manual Ranges: 30 to 80dB, 50 to 100dB, 80 to 130dB
Frequency weighting	‘A’ and ‘C’ (Programmable)
Applicable standards	ANSI / IEC Type 2
Resolution	0.1dB
Maximum/Minimum record	Highest and lowest readings are stored for later recall
Data Hold	Displayed reading is held when HOLD key is pressed
Max Hold	Highest reading displayed only
Response time	Fast: 125ms / Slow:1s (Programmable)
AC Analog output	0.5VAC rms full scale (600Ω output impedance)
Power	9V Battery; Consumption: 6mADC approx.
Operating temperature	32 to 122°F (0 to 50°C)
Operating humidity	Less than 80% RH
Dimensions / Weight	10.6 x 2.7 x 1.1" / 0.63 lbs. (268 x 68 x 29mm / 285g)

Meter Description

1. Microphone
2. LCD Display
3. Power, Hold, and Min/Max buttons
4. Max, Weighting, Response Time, & Range buttons
5. AC output jack
6. Calibration potentiometer
7. RS-232 PC interface jack
8. Battery compartment, tilt stand, and tripod mount on rear



Sound Level Meter Operation

Meter Power

1. The meter is powered by a 9V battery. The battery compartment is located on the rear of the meter and the compartment cover is secured by one Phillips screw. When the battery icon appears on the top left corner of the meter's display, replace the battery.
2. Press the POWER button to turn the meter on. Note that the Meter is equipped with an Auto Power Off feature that shuts the meter off after 10 minutes. To defeat Auto Power Off, put the meter in Record mode by pressing the REC MAX/MIN button.
3. Press the POWER button to turn the meter off.

Default Configuration

1. The meter's default configuration is as follows: Auto Range, 'A' Frequency Weighting, and 'FAST' Response Time
2. The lower portion of the LCD will reflect the meter's configuration, i.e., 'A', 'Fast', 'Auto'.

Measurement Considerations

1. Use a windscreen (not included) to cover the microphone in windy conditions.
2. Calibrate the meter often, especially if the meter has been idle for a long period of time.
3. Do not store/operate the meter in areas of high temperature or humidity.
4. Keep the meter and the microphone dry.
5. Avoid severe vibration when using the meter.
6. Remove the battery when the meter will be stored for long periods of time.

Frequency Weighting

Change the Frequency Weighting by pressing the 'A/C' button. The 'A' or 'C' icon will display on the lower left-hand area of the LCD.

Note: With ‘A’ weighting selected, the meter responds like the human ear (boosting and cutting the noise amplitude over the frequency spectrum - see Appendix). ‘A’ weighting is used for environmental measurements, OSHA regulatory testing, law enforcement, and workplace design. Select ‘C’ weighting for flat response measurements (no boost or cut). ‘C’ weighting is suitable for the sound level analysis of machines, engines, etc. Most OSHA related testing is performed using 'A' Weighting and SLOW Response Time settings.

Response Time

Change the Response Time by pressing the 'FAST/SLOW' button. The 'FAST' or 'SLOW' icon will display on the lower left-hand area of the LCD.

Note: Select FAST to capture noise peaks and noises that occur very quickly. In FAST mode, the meter responds in 200ms. Select the SLOW Mode (meter responds in 500ms) to monitor a sound source that has a reasonably consistent noise level or to average quickly changing levels. Selection of Fast or Slow is determined by the application and any directives or standards related to that application.

Auto/Manual Range

Press the RANGE button to scroll through the following ranges: Auto, 30-80dB, 50-100dB, and 80-130dB. The display will reflect the range for each button press.

Calibration

The Sound Level meter should be calibrated before each use; an external sound level meter calibrator is required. Set the meter to the Manual range (50-100dB), FAST response and ‘A’ weighting before starting.

1. Place the external calibrator over the Sound Level Meter's microphone and turn the Calibrator on.

2. The meter should read close to, or exactly, the calibrator's dB output level. Typical Calibrator output levels are 94dB and 114dB.
3. If the meter is within ± 0.2 dB of the calibrator's output, no adjustment is necessary.
4. Adjust the calibration pot in the output/calibration compartment if necessary to bring the meter display in line with the calibrator output signal.

Taking Measurements

1. Hold the meter in hand, place it on a desktop (using the rear tilt stand), or mount it on a tripod using the tripod mount on the rear of the meter.
2. Point the microphone toward the source of noise/sound to be measured.
3. Read the measurement, in dB units, on the LCD display.

Data Hold

1. Press the HOLD button to freeze the displayed reading. The LCD will display the icon HOLD when Data Hold is engaged.
2. Press the HOLD button to de-activate this feature. The HOLD icon will extinguish.
3. Note that Data Hold is not available while the meter is in the Max/Min Record mode.

Max Hold

1. Press the MAX HOLD button to activate this feature. The LCD will display PH when Max Hold is engaged.
2. The meter will now display only the highest reading. Each time a higher reading is encountered the display will update.
3. Press the MAX HOLD button again to de-activate this feature. The PH icon will extinguish.
4. Note that Max Hold is not available while the meter is in the Max/Min Record mode.

Max/Min Data Recording

The Max/Min feature stores the maximum reading and minimum reading while the user takes measurements. The Max and the Min readings can later be recalled.

1. Press the REC MAX/MIN button to activate this feature. The LCD will display the icon REC and the meter will begin monitoring the highest (Max) and lowest (Min) readings.
2. After measurements are made, press the REC button again to view the Max reading. The MAX icon will appear on the LCD along with the highest reading.
3. Press the REC to view the minimum (MIN) reading. The 'MIN' display icon will appear on the LCD along with the lowest reading.
4. To exit this mode, **press and hold** the REC button until the REC indicator extinguishes.
5. To clear a Max or Min reading, press the HOLD key while viewing either the MAX or MIN value. Note that exiting the Record mode also clears the MAX and MIN values.

Analog Output

The AC analog output transmits 0.5V AC rms full scale. The output impedance is 600Ω maximum. The mono 3.5mm mini-jack is located in the output/calibration compartment on the right side of the instrument. Use a phono plug (3.5mm mono) to connect to the output jack.

PC Interface

The optically isolated RS-232 PC Interface port is located in the output/calibration compartment situated on the lower right side of the meter. The supplied Data Acquisition Software package includes Windows™ 95 / 98 / NT / 2000 / XP compatible software and a meter-to-PC interface cable. Instructions for use can be found on the included software CD.

Important Note on the Automatic Power OFF feature

The 407768 Sound Level Meter has an AUTO POWER OFF feature that turns the meter off after approximately 10 minutes. This feature must be disabled before starting a datalogging session to avoid having the meter automatically shut off in the middle of a session. Disable it by pressing the REC MAX/MIN button to activate the Record mode. While the meter is in the Record mode, the AUTO POWER OFF feature is disabled.

Battery Replacement

The 9V battery that powers the Sound Level Meter is housed in the rear battery compartment. When the battery icon appears on the top left corner of the meter's LCD, it is time to replace the battery.

1. Open the battery compartment by first removing the Phillips screw and then sliding the compartment cover down and off.
2. Replace the 9V battery, slide the cover on, and replace the screw.

Calibration and Repair Services

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

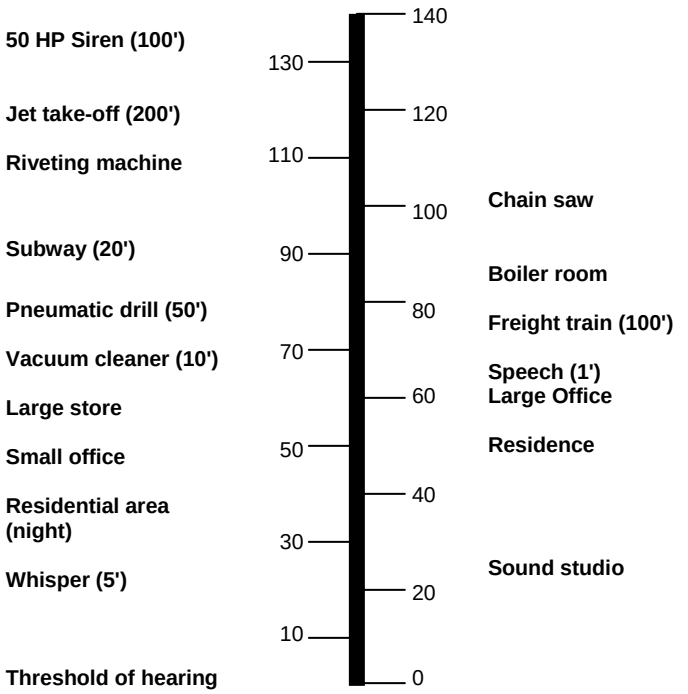
Support Hotline (781) 890-7440
Tech support: Ext. 200; Email: support@extech.com
Repair/Returns: Ext. 210; Email: repair@extech.com
Website: www.extech.com

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at www.extech.com (click on 'Contact Extech' and go to Service Department to request an RA number). A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Appendix

Typical 'A' Weighted dB levels



Frequency Weighting Graph