EXTECH®
INSTRUMENTS

Digital Datalogging Sound Level Meter

Model HD600

Introduction

Congratulations on your purchase of the Extech HD600 Digital Sound Level Meter.

This meter measures and displays sound pressure levels in dB (decibels) from 30 to 130dB in three measurement ranges. In addition to the LCD numerical displays, a bargraph is included for quick and easy viewing of sound level changes. Features include selectable Frequency Weighting ('A' and 'C'), selectable Response Time (Fast and Slow), Max/Min Hold, and AC/DC analog outputs. PC cable and software enable the user to download and analyze measured data. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

Safety

⚠️ Read the following safety information carefully before attempting to operate or service the meter. Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

Environmental Conditions

- Altitude up to 2000 meters
- Relative Humidity: 90% max
- Operating Temperature: 32 to 104°F (0 to 40°C

Maintenance and Cleaning

- Servicing not covered in this manual should be performed by qualified personnel.
- Periodically wipe the case with a dry cloth. Do not use abrasives or solvents.

Meter Description

1. Windscreen
2. LCD Display
3. Setup-button:
4. Record button
5. A/C weighting
6. Max/Min display
7. Range button
8. Microphone
9. Backlight
10. Fast/Slow response
11. HOLD
12. ON/OFF
    Tripod Mount (rear)
    Battery Compartment (rear)
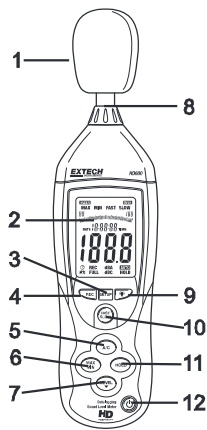
SIDE PANEL

13. External 9VDC power adaptor
14. USB pc port
15. DC/AC analog output
16. CAL potentiometer
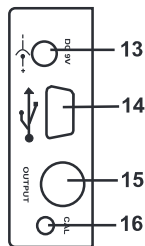
DISPLAY

Symbol	Function
MAX	Maximum hold
MIN	Minimum hold
OVER	Over range
UNDER	Under range
FAST	Fast response
SLOW	Slow response
dBA	A-Weighting
dBC	C-Weighting
REC	Recording data
AUTO	Auto range selection
FULL	Memory full
HOLD	Data hold
⊘	Auto Power Off enabled
🔋	Low battery indicate

Initial Setup

**Battery Installation/AC Adaptor**

The meter can be powered by one 9V battery or by an AC power adaptor. Before inserting or replacing the battery and before connecting the AC adaptor, be sure to turn off the meter.

Time and Date Setup

The SETUP mode is used to set the time, date and default measurement range. Once set, the meter will retain the settings in non-volatile memory. Resetting should not be required.

> **NOTE:** Press the HOLD button at any time during this procedure to save the set data and to return to normal operation

1. Make sure the meter is OFF to start

2. Press and hold the SETUP button and then press the ⏻ power button. Release the SETUP button to enter the setup mode.

3. Press the SETUP button to enter the "minutes" adjustment screen. Press the LEVEL button to adjust the minutes to the current time.

4. Press the SETUP button to enter the "hour" adjustment screen. Press the LEVEL button to adjust the hour to the current time. "h-P" indicates PM and "h-A" indicates AM.

5. Press the SETUP button to enter the "date" adjustment screen. Press the LEVEL button to adjust the date to the current day.

6. Press the SETUP button to enter the "month" adjustment screen. Press the LEVEL button to adjust the display to the current month.

7. Press the SETUP button to enter the "year" adjustment screen. Press the LEVEL button to adjust the display to the current year.

8. Press the SETUP button two more times to view the default range (low "L-050" and high "H-100"). This range cannot be adjusted.

9. Press the SETUP button to enter the time/date reset screen.
   NOTE: If the HOLD button is pressed with this screen displayed the time and date will be reset to default values.
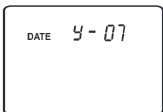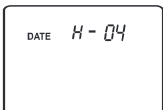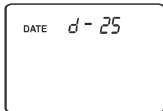
Measurements

MEASUREMENT CONSIDERATIONS

1. Wind blowing across the microphone increases the noise measurement. Use the supplied windscreen to cover the microphone when applicable.
2. Calibrate the instrument before each use if possible. Especially if the meter has not been used for a long period of time.
3. Do not store or operate the instrument in areas of high temperature or humidity.
4. Keep meter and microphone dry.
5. Avoid severe vibration. Protect the meter from impact. Do not drop it. Transport the meter in the supplied case.
6. Remove the battery when the meter is to be stored for long periods of time.

BASIC OPERATION

1. Turn the meter ON by pressing the ⏻ button.
2. Select 'A' or 'C" frequency weighting by pressing the A/C button.
3. Select Fast or Slow response time by pressing the FAST/SLOW button.
4. Use the LEVEL button to select the appropriate range. The range is shown near the top of the display. Use a range that puts the sound level reading in the center of the range. If the OVER or UNDER icons appear on the display, select a new range if possible.
5. The numeric and bargraph displays indicate the sound level measurement.
6. To turn the meter off, press and hold the ⏻ button for 3 seconds.

LEVEL

The LEVEL button is used to select the measurement range. Press this button to step through the ranges as indicated on the display (30 to 80, 50 to 100, 80 to 130, or 30 to 130 autoranging)

A/C FREQUENCY WEIGHTING

Press the A/C button to select 'A' or 'C' frequency weighting. With 'A' weighting selected, the frequency response of the meter is similar to the response of the human ear. 'A' weighting is commonly used for environmental or hearing conservation programs such as OSHA regulatory testing and noise ordinance law enforcement. 'C' weighting is a much flatter response and is suitable for the sound level analysis of machines, engines, etc. Most noise measurements are performed using 'A' Weighting and SLOW Response.

FAST/SLOW RESPONSE TIME

Use the FAST/SLOW button to select a FAST (125 ms) or a SLOW (1 second) response time. Select FAST to capture noise peaks and noises that occur very quickly. Select the SLOW response to monitor a sound source that has a consistent noise level or to average quickly changing levels. Select SLOW response for most applications.

HOLD

Press the HOLD button "freeze" the current reading in the display. Press the button again to resume normal operation.

MAX / MIN

In the MAX/MIN mode the meter will display and hold either the maximum or minimum reading. The display will update only when the measured value exceeds the value presently in the display.

1. Press the MAX/MIN button and the MAX icon will appear on the display. The reading displayed is the highest reading encountered since the MAX mode was entered.
2. Press the MAX/MIN button again. The MIN icon will appear on the display. The reading displayed is the lowest reading encountered since the MIN mode was entered.
3. Press the MAX/MIN button again to exit the MAX / MIN display mode.

RECORDING DATA

The meter can store up to 20,000 readings at an interval rate of 1 to 59 seconds. Each recording session is saved as a data set and each record is saved with a date and time stamp. This data can be downloaded using the supplied software.

Setting the interval time

1. Press and hold the ☀ button while turning the meter ON. **0001** and **Int** will appear in the display.
2. Press the LEVEL button to set the sample interval from once per second to once per 59 seconds.
3. Press the HOLD button to save the interval setting and exit the setting mode.

Recording readings

1. Press the REC button to begin recording. The **REC** icon will appear on the display.
2. Press the REC button again to stop recording.
3. Auto Power OFF is disabled when the record function is active.

Clearing Stored readings

1. Turn the meter OFF.
2. Press and hold the REC button while turning the meter ON.
3. When CLR (clear) appears on the display, release the REC button.
4. All of the readings that were stored in memory are now erased.

BACKLIGHT

Press the ☀ button to turn the LCD backlight on or off. To conserve battery life, the backlight will automatically turn off after approximately 30 seconds.

AUTO POWER OFF

The meter will automatically shut off after approximately 15 minutes of inactivity. Press the SETUP button to disable the auto-power-off feature. The ⊘ icon in the display indicates that the auto power off feature is active.

ANALOG OUTPUTS

The meter is equipped with an analog output feature. The analog output jack is located on the meter's side panel and requires a 3.5mm stereo phono plug. (1-AC Output, 2-DC Output, 3- Ground)
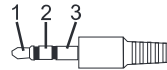
AC analog output

The AC output is a retransmitted representation of the meter's measurement (note that the output factors in the meter's frequency weighting selection 'A' or 'C').

- Output voltage: 1Vrms at full scale of the selected range.
- Output impedance: 100Ω approx.

DC analog output

The DC output signal reflects the frequency weighting selected ('A' or 'C').

- Output voltage: 10mV (±1mV) per displayed dB.
- Output impedance: 1KΩ approx.

Calibration

Frequent calibration is recommended and is often required by noise standards and directives.

1. Turn the meter ON

2. Put the meter in the 'A' weighting mode

3. Put the meter in the 'SLOW' response mode

4. Place the calibrator onto the microphone.

5. Turn the calibrator ON.

6. Adjust the meter's CAL potentiometer located on the side panel so that the meter's display matches the output of the calibrator (typically 94dB or 114dB).

Battery Replacement

1. The ▢ battery icon will appear on the display when the battery needs replacing.

2. Turn the meter OFF and slide the rear battery cover off.

3. Install the 9V battery and replace the cover.

Never dispose of used batteries or rechargeable batteries in household waste. As consumers, users are legally required to take used batteries to appropriate collection sites, the retail store where the batteries were purchased, or wherever batteries are sold.

Disposal: Do not dispose of this instrument in household waste. The user is obligated to take end-of-life devices to a designated collection point for the disposal of electrical and electronic equipment.

Other Battery Safety Reminders
o   Never dispose of batteries in a fire. Batteries may explode or leak.

Never mix battery types. Always install new batteries of the same type.

USB PC Interface

The meter has a built-in USB port for use with the supplied data acquisition software. The software allows the user to download stored data, view, save, export, and print readings from the sound level meter.

SOFTWARE INSTALLATION

Refer to the documentation included with the software for complete details on installation and operation of the application program and the USB driver software.
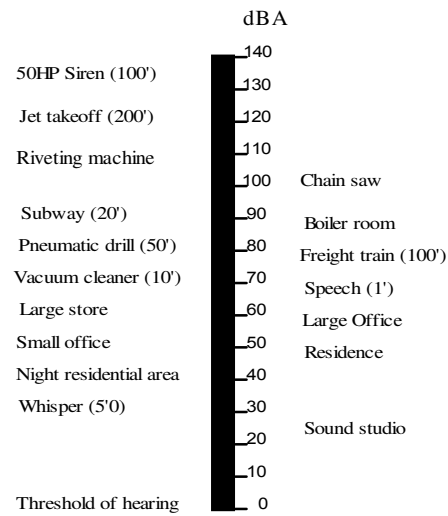
SOFTWARE COMMUNICATION

1. Connect the meter to the PC using the supplied USB cable.
2. Turn the meter ON and press the SETUP button.
3. Launch the application program.
4. Select the COM port which has the CP210X driver installed.
5. Data will appear on the pc screen when communication is established.

Specifications

Applicable Standards	IEC61672-1: 2002 Class 2; IEC60651: 1979 Type 2; ANSI S1.4:1983 Type 2, $C\epsilon$
Accuracy	±1.4dB (under reference conditions)
Frequency Range	31.5Hz to 8kHz
Dynamic Range	50dB
Frequency Weighting	A and C
Time response	Fast (125ms) and Slow (1 second)
Measurement Ranges	30 to 80dB, 50 to 100dB, 80 to 130dB and autoranging (30 to 130dB)
Memory	20,000 records with date and time
Microphone	½" electret condenser
Calibration	Requires external calibrator
Display	4 digit LCD with bargraph and backlighting
Display update rate	2 times/second
Range indicators	"OVER" and "UNDER" range indication
Battery life	30 hours (approximately)
Power supply	One 9V battery (NEDA1604 or equivalent) or 12V/1A AC adaptor
Auto Power Off	After approx. 15 minutes of inactivity with disable
Analog Outputs	AC: 1Vrms full scale; Output impedance: 100Ω
	DC: 10mV/1dB; Output impedance: 1kΩ
Operating conditions	32 to 104°F (0 to 40°C); 10% to 90% relative humidity
Storage conditions	14 to 140°F (-10 to 60°C); 10% to75% relative humidity
Dimensions	10.9 x 3 x 1.97" (278 x 76 x 50mm)
Weight	12.35 oz. (350g)

Typical A-Weighted Sound Levels

dBA

	140	
50HP Siren (100')	130	
Jet takeoff (200')	120	
Riveting machine	110	
	100	Chain saw
Subway (20')	90	Boiler room
Pneumatic drill (50')	80	Freight train (100')
Vacuum cleaner (10')	70	Speech (1')
Large store	60	Large Office
Small office	50	Residence
Night residential area	40	
Whisper (5'0)	30	
	20	Sound studio
	10	
Threshold of hearing	0	