SONIN®

Multi-Measure® 45

Electronic Distance Measuring Tool

Pocket Reference Guide

#10045 CE

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KEYS AND THEIR FUNCTIONS:

Measuring Button - Turns unit on.

Press and **HOLD** to track measurements - for continuous readings while moving. Fastest way to measure but no reading validation . Useful for locating correct surfaces when there are obstacles in the way.

Press and **RELEASE** to validate measurement only when unit is held absolutely still. **Most accurate mode**. Useful in environments when obtaining a stable reading can be difficult. Validates all measurement before displaying. Filters out noise from machinery and other sources.

Multiplies measurements for area and volume. Stores and recalls ⊗ memory.

Adds linear distances, areas and volumes. Stores and recalls ⊕ memory.

Clear/Off Button. Press and immediately release to clear display. Press twice to turn unit off.

Press and hold C/OFF key for more than 2 seconds to change display units. The display will cycle between ***m*** and ***ft:in***. Release C/OFF key to select desired mode.

TAKING A MEASUREMENT - Getting Started:

1) Install a fresh 9V alkaline battery in rear of unit. Push contacts firmly in place.
2) Aim cone at a hard, flat, unobstructed surface such as a wall or mirror.
3) Make certain you have a clear path to the surface (wall). (See FIG. 1)
4) Hold Receiver perpendicular to the surface. (See FIG. 2)

NOTE: Measurement will be taken from bottom of unit.

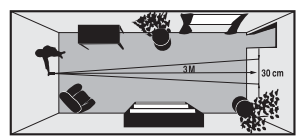
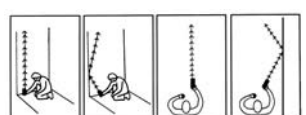


FIG. 1 - The sound waves emitted from this unit spread 1 ft (30 cm) for every 10 ft (3m) measured.



(FIG. 2)

5) Press and hold ⏏ until a consistent measurement appears (about 2 seconds). The unit will continue to take and display rapid measurements as long as the button is held. Release ⏏ button to freeze the measurement.

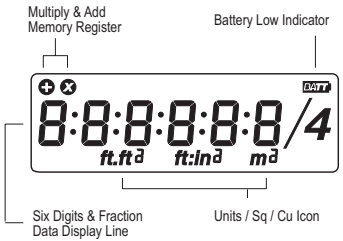
   Press and release ⏏ to validate measurements.

6) Your unit is factory preset to display metric. To set your display to desired mode (m or ft:in) Press and hold C/OFF button until desired mode displays, then release. **NOTE:** Unit will now default to your preset mode even after unit is turned off.

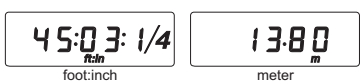
HELPFUL MEASURING HINTS:

1) Measurements cannot be taken through glass or off of soft or padded surfaces.
2) The SONIN 45's range and ability to measure in tight spaces can be increased. Stand in the middle of the distance to be measured and add measurements taken in opposite directions.
3) When measuring in confined spaces (hallways), try to measure down the center line and midway between the floor and ceiling.
4) To find a specific distance from a wall, walk toward or away from the wall while holding down ⏏ .
5) When the surface being measured to has protrusions and recesses, you can determine where the beam is hitting. Move sideways, parallel to the target, while holding down ⏏ . You will see the distance increase for recesses and decrease for protrusions.
6) Be sure the surface you are measuring to is hard, flat and uniform. Some surfaces such as stucco or clapboard may scatter signals.
7) The unit may lock on to a stronger (usually closer) target. If this happens, release the measuring button and try again.
8) Remember that the unit measures from the bottom of the unit (end opposite cone).

READING THE DISPLAY:



The SONIN 45 shows readings in m/cm (to the nearest cm) or feet/inches (to the nearest 1/4 inch).



foot:inch meter

To change the displayed units or convert a displayed value from one mode to another, press and hold the [C OFF] key for more than 2 seconds, the display will begin to cycle. Release [C OFF] key to select.

1) If the unit is unable to take a "good" reading the display will show one of the following:

BLANK SCREEN - Check/replace battery. If unit still doesn't work, call your SONIN Dealer.

When the **BATT** symbol appears on the display, replace the battery.

Out of Range or No Return Signal.

No Valid Reading.

Possible causes for Error 1 or Error 2 include:

a) Measurement out of range [56 cm to 14m (1 ft 10 ins to 45 ft)]. See **Specification Section** on **Range**.

b) Unit is not perpendicular to the surface.

c) Surface is not hard and flat.

d) Interference from external noise sources (see section on **Environmental Conditions**).

Math error - square or cube result overflow.

2) If you get readings which are excessively long or short, the likely causes are:

a) The unit is not being held parallel to the floor. Hold the unit parallel to the floor and at 90° to the surface being measured to. (See FIG. 2).

b) The surface you are measuring to is not sufficiently flat and the sound waves are continuing to rebound. Place a flat object, such as a board or mirror against the surface and measure to the object. (See FIG. 2).

c) The surface is not large enough.

d) Environmental factors such as noise from machinery or close proximity to an air conditioner or computer screen.

3) If you get readings which are too short for the distance being measured, make sure there is a sufficiently clear and sufficiently wide path to the surface. Remove any objects in the way or select a different surface to measure to.

4) Range and accuracy can be affected by environmental factors such as wind, temperature, humidity and altitude (see section on **Environmental Conditions**).

COMPUTATION FUNCTIONS:

To make the computations in the descriptions below, the [⏏] symbol indicates taking an actual measurement (length, width or height).

[+] **Adding**: The unit adds linear measurements, areas or volumes. When the [+] is pressed the " ⊕ " symbol will appear in the upper left corner of display.

[X] **Multiplying**: The unit multiplies linear measurements to compute areas and volumes. When the [X] is pressed the " ⊗ " symbol will appear in the upper left corner of the display.

Adding distances:
[⏏] [+] [⏏] [+]
(Display shows **ft:in** or **m**)
(Continue until you are done adding distances.)

Multiplying to compute areas:
[⏏] [X] [⏏] [X]
(Display shows **ft.ft²** or **m²**)

Multiplying to compute volumes:
[⏏] [X] [⏏] [X] [⏏] [X]
(Display shows **ft.ft³** or **m³**)

To add areas:
[⏏] [X] [⏏] [X] [+]
[⏏] [X] [⏏] [X] [+]
(Display shows total area **ft.ft²** or **m²**)
(Continue until you are done adding areas)

To add Volumes:
[⏏] [X] [⏏] [X] [⏏] [X] [+]
[⏏] [X] [⏏] [X] [⏏] [X] [+]
(Display shows total volume **ft.ft³** or **m³**)
(Continue until you are done adding volumes.)

Note: The SONIN 45 can only add like units of measure.

MEMORIES:

The SONIN 45 has two memories. Memories can be stored using the [X] and [+] buttons.

To store a measurement:

To store in ⊗ memory:
Press [⏏], then [X] (the " ⊗ " symbol will appear in the upper left corner of the display).

To store in ⊕ memory:
Press [⏏], then [+] (the " ⊕ " symbol will appear in the upper left corner of the display).

NOTES:

1) To store 2 linear measurements be sure to store the first in the ⊕ memory and the second in the ⊗ memory.
2) Storing a measurement in the ⊕ memory after storing in the ⊗ memory will erase the number in the ⊗ memory.
3) Turning the unit off or making any computation using the [+] or [X] key will erase the number stored in that memory.

TO RETRIEVE A STORED VALUE IN ⊕ AND ⊗ :

1) Clear the display by pressing and immediately releasing the [ON] button.
2) Once you have cleared the display, press the [+] or [X] button to retrieve the reading stored in that memory.

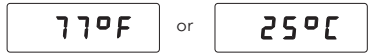
TEMPERATURE COMPENSATION:

Because temperature affects the speed of sound, the SONIN 45 has automatic temperature compensation for greater accuracy. In order to make the most of this feature, wait 2 minutes for each 1°C (1 minute for each 1°F) of temperature difference between locations.

Displaying temperature to improve accuracy: Since temperature affects accuracy, the SONIN 45 is most accurate when its internal temperature matches the air temperature.

To display temperature:
press and hold [+] key, then press [⏏] key, the internal temperature will appear on the display immediately (in °C when M display units are selected or in °F if selected display units are ft/ins.)

For example:



To go back to measurement mode, press and release [ON] key or press the measure key directly.

Hint: To speed equalization of the SONIN 45's internal temperature versus air temperature, wave the unit back and forth in the air to circulate room temperature air through the unit. For additional information, see "**Temperature**" in the section on **Environmental Conditions**.

LOW BATTERY INDICATOR:

Replace the battery when the BATT symbol appears on the LCD.

SPECIFICATIONS:

Range:
Min: 1 ft 10 ins (0.56 m)
Typical: 45 ft (13.7 m)
Actual: Will vary depending on environmental conditions.

Accuracy:
99.5% ±1/4 ins (1 cm) When environmental conditions are as follows:
Temperature: 0 to 30°C (32 to 86°F)
Relative Humidity: 30 to 70%
Altitude: -328 ft to +328 ft (-0.1 to +0.1 km)
Wind Speed: Still Air

Examples: At 15 ft (4.57m) your reading will be within 1 1/4 ins (3 cm) and at 45 ft (14m) your reading will be within 3 ins (8 cm).

Resolution: 1/4 in (1 cm)

Ultrasonic Frequency: 40 kHz

Battery: 9 volt (alkaline recommended)

Current Consumption: 8 - 13 mA
(Approximately 50 hours continuous use with a new 9 volt alkaline battery)

Operating Temperature:
0 to 38°C (32 to 100°F)

Auto Shut-off:
Approximately 7 minutes after last key press.

Size:
5 1/4 x 2 7/8 x 1 5/16 ins (132 x 73 x 33mm)

Weight:
90 g (3.2 oz) without battery

ENVIRONMENTAL CONDITIONS THAT COULD AFFECT PERFORMANCE:

IMPORTANT: Ultrasonic Distance Measuring Tools work best for quick and easy measuring and estimating. They are not intended for precision work, although they can be very accurate under optimal conditions.

Humidity - Humidity and temperature can affect the range and accuracy of all ultrasonic distance measuring tools. They may give measurements that are longer or shorter than their specifications (depending on atmospheric conditions). The range is longest in high temperature/high humidity and low temperature/low humidity. The range is shortest in high temperature/low humidity and low temperature/high humidity.

Humidity effects on accuracy are greatest at high temperatures and negligible at low temperatures. At 38°C (100°F) and 99% R.H., the distance measurement will be short by 0.6%. At 38°C (100°F) and 0% Relative Humidity, the distance measurement will be long by 0.6%. At 0°C (32°F) the distance measurement will essentially not be affected by humidity.

Temperature - Your SONIN 45 has unique automatic temperature compensation to ensure consistency of measurements between 0°C to 38°C (32°F and 100°F). The response rate of this circuitry enables you to move between warm and cold areas and measure with reasonable accuracy.

However, we recommend that you do not leave your SONIN unit in very cold or very hot conditions (e.g. sunlight in a car), as the unit will then require more time to adjust to air temperature.

Altitude/Barometric Pressure - Altitude and barometric pressure can affect the range and accuracy of all ultrasonic distance measuring tools.

As the Altitude increases (barometric pressure decreases), the range is reduced. As altitude decreases (barometric pressure increases), the range is increased.

To correct for altitude (pressure) effects on accuracy, subtract 0.4% of the measured distance for each 0.3 km/-15mm Hg (1000 ft/-0.6" Hg) you are above sea level. Add 0.4% of the measured distance for each 0.3km/+15mm Hg (1000 ft +0.6" Hg) you are below sea level (Sea Level = 760mm Hg).

Noise - High frequency noise from machinery, engines, computers, stereos, TV sets, etc. can affect the reading and you may get random readings. Stand away from or shut off this type of equipment when measuring.

Outdoor Measurements - Your SONIN 45 is designed for indoor use.

FCC NOTE:

This device has been tested and found to comply with the limits for a Class B device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna
– Increase separation between the device and receiver

This Class B Digital Apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

TECHNICAL ASSISTANCE

If you have any questions or need technical assistance, e-mail to:

technicalsupport@sonin.com

CUSTOMER SERVICE

SONIN takes pride in offering unmatched customer service to owners of SONIN products. If you have any questions or would like additional information, please call:

1 - 800 - 223 - 7511 (USA)

or e-mail to:

customerservice@sonin.com