EM58

ULTRASONIC DISTANCE MEASURER

Instruction Sheet

INTRODUCTION

This instrument includes a Main Unit and a Target Unit. It can be used to measure distance, area and volume. It has two distance measurement modes, user can select any mode at option. It can measure distance up to 50m. It can be used in building, building finishing, etc.

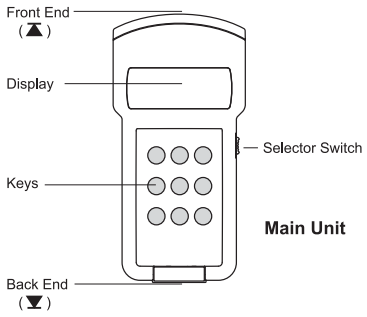
FEATURES

1. Measures distance
2. Calculates area and volume and performs distance addition calculation.
3. Auto power off / Manual power off
4. Distance reading storage and recall
5. Measurement start point selection
6. Imperial or metric unit.

SPECIFICATION

One Unit Mode:
Measurement Range: 0.5m ~ 18m
Accuracy: ± (0.5%+1 digit)
Test Condition: 0 ~ 40°C, 30 ~ 70%RH, in indoor or windless environment
Two Unit Mode:
Measurement Range: 2m ~ 50m
Accuracy: ± (1% + 1 digit)
Test Condition: 0 ~ 40°C, 30 ~ 70%RH, in indoor or windless environment
Resolution: 0.01m
Battery: 9V, 6F22 or equivalent
Operating Environment: 0°C ~ 40°C, < 80%RH
Storage Environment: -10°C ~ 50°C, < 80%RH
Size:
Main Unit: 150 x 75 x 42mm
Target Unit: 120 x 77 x 28mm
Weight:
Main Unit: about 165g (including battery)
Target Unit: about 130g (including battery)

STRUCTURE



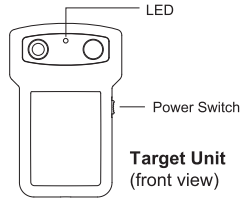


Figure 1

SYMBOL EXPLANATION

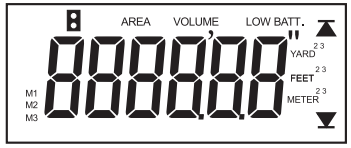


Figure 2

B --- The Main Unit is in Two Unit mode.
AREA---- An area value is being displayed.
VOLUME---- A volume value is being displayed.
LOW BATT.--- The battery of the Main Unit is low and should be replaced immediately.
M1: represents the distance reading stored by pressing the **M1** key
M2: represents the distance reading stored by pressing the **M2** key
M3: represents the distance reading stored by pressing the **M3** key

The Units on the Display:
YARD; **YARD²** : square yard; **YARD³** : cubic yard

METER; **METER²**: square meter;
METER³: cubic meter

' ---- feet; **"** ----inch
(Example: 6' 1" means 6 feet and 7 inches)
FEET²: square feet
FEET³: cubic feet

Measurement Start Point:
▲--- Distance measurement starts from the front end of the Main Unit.
▼--- Distance measurement starts from the back end of the Main Unit.

CONTROL INSTRUCTION

Control of the Main Unit :

UNIT CLR Key
a. Press this key to select desired reading unit.
b. Press this key for about 2 secs to erase all stored data, the built-in buzzer will sound two beeps as an indication.
c. Press this key to delete the error indicator " E " when it appears on the display.

✕ Key
Used in calculating area or volume.

SUM Key
Used in distance addition calculation.

= Key
Used to display the result of computing.

M1, M2, M3 Keys
Used to store distance reading or recall the stored reading.

BASE Key
This key is enabled only in distance measurement mode. You can press this key to select desired measurement start point (the front end or back end of the Main Unit), the display will show the corresponding symbol (▲ or ▼). (see Figure 1)

TEST ON Key
Used to perform distance measurement or arouse the Main Unit from Sleep mode.

Selector Switch
Used to select One Unit mode or Two Unit mode as well as to turn on or off the Main Unit. There are three positions for this switch:
L --- Two Unit mode
S --- One Unit mode
OFF --- turn off the Main Unit

Control of the Target Unit:

Power Switch
Used to turn on or off the Target Unit.

OPERATION INSTRUCTION

To Turn on the Instrument

1. **To Turn on the Main Unit:**
Set the Selector Switch to the " **S** " or " **L** " position.

The display is blank if the Main Unit is in Sleep mode. Press the TEST ON key for about 2 secs to arouse the Main Unit from Sleep after it has been in Sleep mode for 3 secs.

Each time you turn on or arouse the Main Unit, the display will show the approximate environment temperature in °C. You must wait about 6 secs and then press any key to quit temperature mode.

When the Selector Switch is moved between the " **S** " and " **L** " positions, the display will read zero and change to the distance measurement mode (a mode in which you don't perform area, volume and distance addition calculations and the the symbols " **M1** ", " **M2** " and " **M3** " do not flash on the display).

2. **To Turn on the Target Unit:**
Set the Power Switch to " ON " position, the LED will light green constantly for about 4 secs and then start flashing green.

Note:
When the LED flashes red, the Target Unit's battery is low and should be replaced immediately.

To Select Measurement Start Point

Press the **BASE** key when the Main Unit is in distance measurement mode.

To Erase all the Stored Data

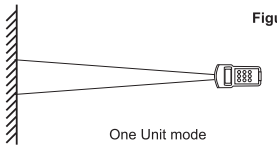
Press the UNIT CLR key (for about 2 secs) until the display reads zero and the symbols " **M1**", " **M2** " and " **M3** " don't appear on the display.

Distance Measurement

You can use One Unit mode or Two Unit mode to perform distance measurement.

1. **One Unit Mode**

Figure 3



One Unit mode

a. Set the Selector Switch in " **S** " position.

If the Main Unit is in Sleep mode (the display is blank), press the TEST ON key for about 2 secs to arouse it after it has been in Sleep mode for 3 secs.

The display shows the approximate environment temperature. Wait about 6 secs, then press any key to quit temperature mode.

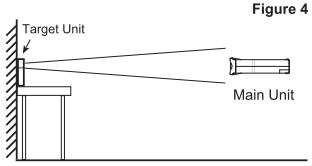
b. Hold the Main Unit and point it to the flat surface perpendicularly, then press the TEST ON key.

c. Read the distance reading on the display.

Note:
1. In One Unit mode, the distance reading indicates the distance from the Main Unit's front end or back end (depending on the measurement start point you selected) to the flat surface.
2. In temperature mode, if you don't press any key for about 15 secs, the Main Unit will turn off automatically and go into Sleep mode. In other modes, the Main Unit will turn off automatically and go into Sleep mode in about 20 secs when not in use.
3. Each time you turn on or arouse the Main Unit, the display will show the approximate environment temperature. You must wait about 6 secs before you press any key to quit temperature mode.

2. **Two Unit Mode:**

Figure 4



Two Unit mode

a. Place the Target Unit in desired position, ensure that the Target Unit is at a height of more than 1m above ground or floor.

Turn on the Target Unit.

b. Set the Main Unit's Selector Switch in " **L** " position.

If the Main Unit is in Sleep mode, press the TEST ON key for about 2 secs to arouse it after it has been in Sleep mode for 3 secs.

The display shows the approximate environment temperature. Wait about 6 secs, then press any key to quit temperature mode.

c. Hold the Main Unit and point it to the Target Unit perpendicularly.
Note: The Main Unit should be level with the Target Unit and point perpendicularly to the front of the Target Unit. (see Figure 4)

d. Press the TEST ON key. Don't move the Main Unit until the display shows the distance reading. (Because the Main Unit measures several times to ensure accuracy, you may need to wait several seconds before the display shows reading. Don't be impatient while waiting.)

If the display shows the error indicator " **E** " , it means that the Main Unit is not level with the Target Unit or does not point perpendicularly to the front of the Target Unit. Aadjust the Main Unit's position or direction and then try again.

Note:
a. In Two Unit mode, the distance reading indicates the distance from the Main Unit's front end or back end (depending on the measurement start point you selected) to the front of the Target Unit.
b. The Target Unit should be placed on a platform whose height is at least 1m. There must be no obstacle between the Main Unit and the Target Unit.
c. If the Target Unit does not receive signal from the Main Unit for about 15 minutes, it will turn off automatically. To turn it on again, move its Power Switch to **OFF** position first and then to **ON** position.
d. Each time you turn on or arouse the Main Unit, the display will show the approximate environment temperature, you must wait about 6 secs before you press any key to quit temperature mode.
e. To avoid possible unstable reading, don't measure a long distance in a complex noise environment.

Storing Measurement Reading

a. Press the TEST ON key to perform distance measurement and get a measurement reading on the display.

b. Press **M1**, **M2**, or **M3** for about 1 sec to store this reading. The display shows the corresponding symbol (" M1 ", " M2 ", or " M3 "), this symbol blinks to indicate that it represents the current reading.
Note: A distance reading can only be stored one time. When you store a distance reading, its unit, measurement start point and operating mode will be stored together.
Area, volume and sum data can not be stored.

Recalling the Stored Reading

When the display shows the symbol " M1 ", " M2 ", or " M3 ", it means that in the memory there is a stored reading represented by this symbol. When the display does not show the error indicator " E ", pressing the corresponding key (**M1**, **M2**, or **M3**, according to the symbol) will recall this stored reading and its unit, measurement start point and operating mode, the symbol will flash.

Note:
A measurement result can only be stored one time.

Calculating Area or Volume

You can calculate area or volume in One Unit mode or Two Unit mode. Area equals length times width, volume equals length times width times height.

The procedure is:

a. Press and hold down the UNIT CLR key until the display reads zero and the symbols " M1 ", " M2 "and " M3 " do not appear on the display.

b. Press the TEST ON key to perform distance measurement and get a reading, press **M1** to store this reading. The displays shows the symbol " M1 ", which represents this reading.

Press the TEST ON key to perform distance measurement and get the second reading, press **M2** to store this reading. The display shows the symbol " **M2** ", which represents the second reading.

Press the TEST ON key to perform distance measurement and get the third reading, press **M3** to store this reading. The display shows the symbol " **M3** ", which represents the third reading.

c. Then you can choose one of the following three steps to complete area calculation:

1. Press **M1** → press **X** → press **M2** → press =, the display shows the result of multiplying the two stored readings represented by the symbol " M1" and the symbol " M2 " respectively.

2. Press **M1** → press **X** → press **M3** → press =, the display shows the result of multiplying the two stored readings represented by the symbol " M1" and the symbol " M3 " respectively.

3. Press **M2** → press **X** → press **M3** → press =, the display shows the result of multiplying the two stored readings represented by the symbol " M2 " and the symbol " M3 " respectively.

d. After you have performed the steps described in section a and section b, you can follow the following procedure to complete the volume calculation:

Press **M1** → press **X** → press **M2** → press **X** → press **M3** → press =, the display shows the result of multiplying the three stored readings represented by the symbols " M1", " M2 " and " M3 " respectively.

Note:
When the display shows area or volume value, the unit, the measurement start point and operating mode shown on the display are determined by the last reading used in area or volume calculation.

Distance Addition Calculation

There are are two methods you can use to perform distance addition calculation.

Method 1:
a. Press and hold down the UNIT CLR key until the display reads zero and the symbols " M1 ", " M2 "and " M3 " do not appear on the display.

b. Press the TEST ON key to obtain the first distance reading, press **SUM**. Press the TEST ON key to obtain the second distance reading, press **SUM**...repeat the operation to perform distance addition calculation.

Method 2:
a. Press and hold down the UNIT CLR key until the display reads zero and the symbols " M1 ", " M2 "and " M3 " do not appear on the display.

b. Press the TEST ON key to perform distance measurement and obtain the first reading. Press **M1**, then press **SUM**.

c. Press the TEST ON key to perform distance measurement and obtain the second reading. Press **M2**, then press **SUM**. The display shows the sum of the first reading and the second reading.

d. Press the TEST ON key to perform distance measurement and obtain the third reading. Press **M3**, then press **SUM**. The display shows the sum of the first reading, the second reading and the third reading.

Note:
When the display shows sum, the unit, the measurement start point and operating mode shown on the display are determined by the last reading used in distance addition calculation.

NOTE

1. a. In One Unit mode, the Main Unit requires a clear view within a cone of ±13°.

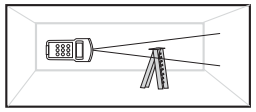


Figure 5

In this figure the distance to the ladder will be measured instead of the wall. The Main Unit requires a clear view within a cone of ±13°.

b. When you perform distance measurement in Two Unit mode, you should point the Main Unit To the Target Unit at a rectangular angle. This rectangular angle should be controlled less than ±5° deviation.
2. The display may show the error indicator " **E** " in one of the following conditions:
a. The distance under measurement is out of the instrument's measurement range.
b. You perform measurement when the instrument's battery is low.
c. The sum of distance addition calculation exceeds 655.35m.
d. Area value exceeds 3600.00m^2.
e. Volume value exceeds 216000.00m^3.
f. When the display shows a volume value exceeding 28300.5m^3, you press the UNIT CLR Key to change unit from cubic meter to cubic feet.
When the display shows " **E** ", you can press the UNIT CLR or TEST ON key or move the Selector Switch to another mode position to delete it and the unit will change to distance measurement mode.
3. It will affect the result of measuring if there is an interference source nearby.
4. In One Unit mode, it will affect the measurement result if the reflected surface of the target is irregular or soft.
5. In One Unit mode, the measured distance must not be less than 0.5m, and in Two Unit mode, the measured distance must not be less than 2m; otherwise the measurement result may be inaccurate.
6. Environment requirement:
Temperature and humidity can affect measurement accuracy. When accuracy is critical, use the instrument only in indoor or windless environment and at operating temperature of 0°C to 40°C, with relative humidity between 30% and 70%RH.
7. Wait about 10 minutes before you perform distance measurement when the ambient temperature changes.
8. Don't store the instrument in reach of child and infant when it is not in use. Don't let child or infant play with the instrument.

MAINTENANCE

When the display shows the symbol " LOW BATT. ", the battery of the Main Unit is low and should be replaced immediately. To replace the battery, turn off the Main Unit first, then slide out the battery cover, replace the exhausted battery with a new one of the same type (9V, 6F22 or equivalent), Reinstall the battery cover.

When the Target Unit's LED flashes red, the Target Unit's battery is low and should be replaced immediately. To replace the battery, turn off the Target Unit first, then remove its battery cover, replace the exhausted battery with a new one of the same type (9V, 6F22 or equivalent), Reinstall the battery cover.

Remove all batteries from the Main Unit and the Target Unit if you don't use the instrument in a long period.

While cleaning, use a soft moist cloth. Never use any solvent.

DECLARATION

1. This contents of this Instruction Sheet are subject to change without notice.
2. Our company will not take the other responsibilities for any loss.
3. The contents of this Instruction Sheet can not be used as the reason to use the instrument for any special application.

DISPOSAL OF THIS ARTICLE

Dear Customer,
If you at some point intend to dispose of this article, then please keep in mind that many of its components consist of valuable materials, which can be recycled.
Please do not discharge it in the garbage bin, but check with your local council for recycling facilities in your area.