

# Bilateral Laser Distance Meter







## User Manual





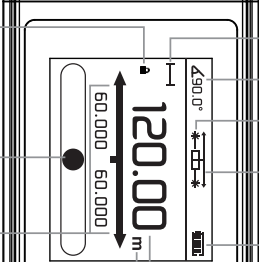
## Safety Regulations

**Please read the safety regulations and operation guide carefully before operating.**

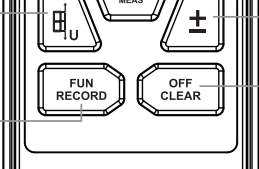
-  Please read all of the operational guide and safety regulations in this manual before operation. Improper operations without complying with this manual may cause damage to the device, influence on measurement result or personal injury to the user or a third party.
-  The instrument is not allowed to disassemble or repair in any ways. It is forbidden to do any illegal modification or performance change for laser emitter. Please keep it out of reach of children and avoid being used by any irrelevant person.
-  It is strictly prohibited to shoot eyes or other parts of body with the laser. It is not allowed to take the laser to shoot the surface of any highly reflective objects.
-  Due to electromagnetic radiation interference to other equipment and devices, please don't use the meter in the plane or around medical equipment, don't use it in inflammable, explosive environment.
-  Discarded meter device should not be processed just like household garbage, please handle it in line with related law and regulations.
-  Any quality issues or any questions on the meter, please contact local distributors or manufacturer in time, we are ready to offer solutions for you.

# Screen/Keys

## • Screen

- 
- Screen lock indication
  - Level bubble
  - Auxiliary display area
  - Unit
  - Measuring mode
  - Angle indication
  - Laser indication
  - Measuring reference indication
  - Battery level indication
  - Main display area
  - Power-on


## • Keys

- 
- Unit/ Measuring reference
  - Length/Area/ Volume/ Triangulation measuring mode
  - Add/Subtract /Lock screen
  - Power-off/ Clear


## Main Functions

### ● Turn on/off the Instrument

In the off state, long press  for 3 seconds to start the instrument, and the instrument enters the test mode.

In the on state, long press  for 3 seconds to turn off the instrument. If no operation is performed within 180 seconds, the instrument will shut down automatically.

### ● Unit Setting

In the mode of length measuring, long press  to enter the page of units measurement. The instrument provides 6 optional units.

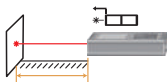
Measurement units:

	Length	Area	Volume
1	0.000 m	0.000 m <sup>2</sup>	0.000 m <sup>3</sup>
2	0.00 m	0.00 m <sup>2</sup>	0.00 m <sup>3</sup>
3	0.0 in	0.00 ft <sup>2</sup>	0.00 ft <sup>3</sup>
4	01/16 in	0.00 ft <sup>2</sup>	0.00 ft <sup>3</sup>
5	0'00" 1/16	0.00 ft <sup>2</sup>	0.00 ft <sup>3</sup>
6	0.00 ft	0.00 ft <sup>2</sup>	0.00 ft <sup>3</sup>

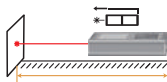
## ● Setting of Measurement Reference

Press  to set the measurement reference.

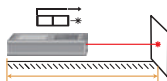
The default benchmark is bidirectional measurement.



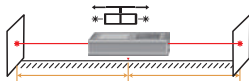
Left-forward datum



Left-back datum




Right-back datum




Bidirectional measurement

## ● Selection of Measuring Mode

Press  to enter mode selection, and the screen will display as follows:



Press   to switch mode;

Press  to select mode;

Press  to return.

The instrument provides 9 optional modes :

	Length mode		Height calculation by measuring angle
	Area mode		Height calculation of right triangle
	Volume mode		Hypotenuse calculation of right triangle
	Wall area mode		Sum calculation of the triangle base sides
			Auxiliary height calculation of right triangle

## ● Screen Rotation and Lock

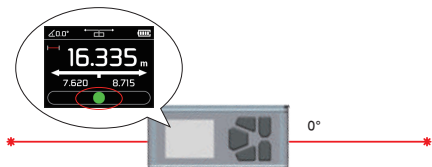
The instrument supports automatic screen rotation.

Long press to lock the screen direction, and the screen displays . Long press again to cancel the screen orientation lock.



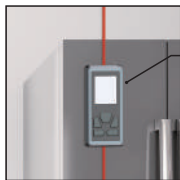
## ● Electronic Level Bubble

The instrument is equipped with an electronic level bubble to measure the levelness of the plane.



## ● Strong Magnetic Adsorption

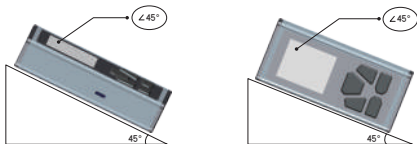
The back of the instrument is magnetic, so that the instrument can be adsorbed on the metal surface.



A magnetic object can be fixed by the strong magnetism.

## ● Angle Measurement

The instrument has built-in tilt sensor, which can measure the angle between the base and the two planes of the instrument in real time.



## ● Sound & Self-calibration

Press and hold **OFF CLEAR** key and press **MEMO** key to start. When the screen lights up, release **MEMO** key immediately. When "Sound" appears on the screen, release **OFF CLEAR** key, to enter the sound setting.

### 1. Sound Setting



Switch the sound on/off by pressing **U** or **+**; Press **MEMO** key to save the settings and enter the self-calibration.

### 2. Self-calibration

The self-calibration is divided into two steps: firstly adjust the front-end value (laser emission at the top of the instrument near the display), and then adjust the back-end value (laser emission at the bottom of the instrument near the button). The adjustable range is: -0.009m to +0.009m. Operation is as follows:

- Short press **U** or **+** key to modify the self-calibration value.



- After the sound setting, enter the front-end adjustment; Short press  key to enter the back-end adjustment. After the back-end adjustment is complete, press  key to enter the measurement interface.



### 3. Example of Self-calibration :

Suppose the actual distance is 3.780m.


- Set the instrument to the left-back reference, if the measured value is 3.778m, 2mm less than the actual value, then adjust the front-end value to +0.002m. If the measured value is 3.783m, 3mm larger than the actual value, then adjust the front-end value to -0.003m;
- Set the instrument to the right-back reference, if the measured value is 3.778m, 2mm less than the actual value, then adjust the back-end value to +0.002m, If the measured value is 3.783m, 3mm larger than the actual value, then adjust the back-end value to -0.003m.

## Distance/Area/Volume/Pythagorean /Add/Subtract Measurement


### ● Length Mode-Single Measurement :

Press  in length mode, and the instrument emits laser to lock the measuring point. Then press  for a single distance measurement, and the measurement results will be displayed in the main display area. In bidirectional measurement, the auxiliary display area displays the distance between the left and right ends.

### ● Length Mode-Continuous Measurement: :

Long press  in length mode to enter continuous measurement mode. The screen displays the real-time measurement data, including maximum value, and

minimum value. Press  or  to exit the continuous measurement mode.

Midpoint searching: set the reference to bidirectional reference, long press  to start continuous measurement. Follow these tips to look for the middle point.

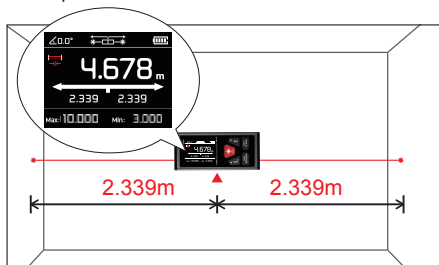
Landscape screen:

1. If **【←】** is displayed on the screen, please move to the left
2. If **【→】** is displayed on the screen, please move to the right


Portrait screen:


1. If **【↑】** is displayed on the screen, please move up
2. If **【↓】** is displayed on the screen, please move down


If **→|←** is displayed on the screen, the current position is the midpoint.




● **Area Measurement**  :


Press  to measure the first side (length)


Press  to measure the second side (width)

The auxiliary display area displays measured values of the length and width of the rectangle. In the measurement process, user can press  to clear the measurement results and measure again.


● **Volume Measurement**  :

Press  to measure the first side (length)


Press  to measure the second side (width)


Press  to measure the third side (height)

The instrument can calculate volume automatically and display the results in the main display area. The auxiliary display area displays measured value of the length, width and height of the cube.


In the measurement process, user can press  to clear the measurement results and measure again.

● **Wall area measurement**  :

Press the  to measure the height of the wall;

Press  to measure the width 1 of wall 1;

The instrument will automatically calculate the wall area = height x width 1;

Press  to measure the width 2 of wall 2;


The instrument will calculate the total area of the wall automatically.

$$\text{Total Area} = \text{Height} \times (\text{Width 1} + \text{Width 2})$$


By analogy, press  to measure the width of the wall n;


$$\text{Total Area} = \text{Height} \times (\text{Width 1} + \text{Width 2} + \dots + \text{Width n});$$



In the measurement process, user can press  to clear the measurement results and measure again.

## ● Indirect Pythagorean Measurement :

- 1 Calculate height by measuring angle  (as shown in Figure 1)

Press  to measure the length of the hypotenuse (a) according to the screen prompt.

The instrument will simultaneously measure the angle  $\theta$  between the hypotenuse and the base.

The instrument automatically calculates the horizontal distance b and the vertical height h.

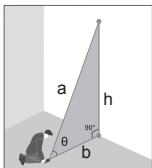





Figure 1



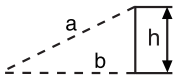
Screen

- ② Measure the height of right triangle  (as shown in Figure 2)

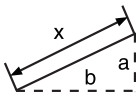
Press  to measure the length of the hypotenuse (a) according to the screen prompt.

Press  to measure the length of the right angle (b).


The instrument will automatically calculate the height (h) of the triangle after the second measurement.





(Figure 2)




(Figure 3)


- ③ Measure the hypotenuse of right triangle  (as shown in Figure 3)


Press  to measure the length of the side (a) according to the screen prompt.


Press  to measure the length of the side (b).

The instrument will automatically calculate the hypotenuse ( $x$ ) of the triangle after the second measurement.

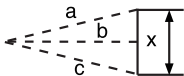
- ④ Measure the sum of triangle base  (as shown in Figure 4)

Press  to measure the length of the hypotenuse (a) according to the screen prompt.

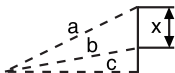
Press  to measure the length of the side (b).

Press  to measure the length of the other hypotenuse (c).


The instrument will automatically calculate the height ( $x$ ) of the triangle after the measurement.





(Figure 4)




(Figure 5)

- ⑤ Measuring triangle auxiliary height  (as shown in Figure 5)

Press  to measure the length of the hypotenuse (a) according to the screen prompt.

Press  to measure the length of the other hypotenuse (b).

Press  to measure the length of the side (c).

After measurement, the instrument will automatically calculate the height ( $x$ ) of the auxiliary line of the triangle.

In the Pythagorean measurement mode, the length of the right-angle side must be less than the hypotenuse, otherwise the instrument will give an error prompt. To ensure the accuracy of measurement, make sure to measure from the same starting point, and in the order of hypotenuse and right-angle side.


## ● Addition and Subtraction Measurement

### 1、Length Addition and Subtraction




Measure a set of data in length mode




Press  to enter the addition mode



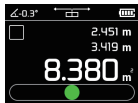
When measuring again, the instrument will automatically add the data and sum it up

Short press , "+" appears in the main display area of the screen, and the instrument enters the addition measurement mode. If the instrument continues to measure, it will automatically add up the measured value.

In the addition mode, press  again, "-" appears in the main display area of the screen, and the instrument enters the subtraction measurement mode. If the instrument continues to measure, the instrument will automatically subtract the measured value.

### 2、Area/Volume Addition and Subtraction

The operation of adding and subtracting volume is the same as that of area. Here, take area addition and subtraction as an example:



(Figure 1)





(Figure 2)





(Figure 3)


Step 1: Measure the area once (Figure 1);

Step 2: Press  , "+" appears in the main display area of the screen, and the instrument enters the addition measurement mode. Then measure the area for the second time (Figure 2);

Step 3: Press  and the instrument will automatically calculate the sum of two areas (Figure 3).





Area subtraction: In the first step, press  to enter the addition mode first. Then press  to switch to the subtraction mode. The subsequent operation is similar to the addition mode.

Multiple add/subtract operations:





In the step 2, after the second area is obtained, short press  again to continue adding/subtracting the next area. Finally, according to the step 3, the result is obtained.



## Records

- After the measurement is completed, the instrument automatically stores the results.
- Long press  to view records; Short press   to view the record forward or backward.  
Long press  to clear all records.

## Charging

- If the instrument shows , it means the battery is low. It is recommended that users charge it immediately to avoid affecting the measurement accuracy.
- Use a compliant charger with DC5V  $\geq$ 1A output for charging. Phone chargers are recommended.
- Charging indication: If  scrolls, it means that the battery is not fully charged. If  is displayed and  is no longer rolling, the battery is fully charged.
- Battery maintenance: If not used for a long time, it is recommended to fully charge the instrument and charge it once every six months to avoid battery discharge damage.

## Prompt Information

During usage, the following prompt information may be displayed in the main display area:

Info	Cause	Solution
Err	Out of measuring range	Use the instrument within the measurement range
Err1	Weak signal	Measure the target point with stronger reflectivity
Err2	Strong signal	Measure the target point with weaker reflectivity
Err3	Low battery voltage	Charge the battery
Err4	Out of operating temperature range	Use the instrument in the specified environment
Err5	Wrong Pythagorean measurement	Remeasure, ensure the hypotenuse is longer than the right-angle side
Err6	Angle sensor failure	Return to factory for repair

## Specifications

Item	SW-DR60	SW-DR100
Maximum measuring distance	60m(Unidirectional) 120m(Bidirectional)	100m(Unidirectional) 200m(Bidirectional)
Accuracy	$\pm(2\text{mm}+D*1/10000)^*$ (Unidirectional)	
Angle measuring range	$\pm 90^\circ$	
Continuous measurement	✓	
Area/Volume measurement	✓	
Wall area measurement	✓	
Pythagorean measurement	✓	
Angle and height measurement	✓	
Length addition/subtraction measurement	✓	
Max/Min value	✓	
Electronic level bubble	✓	
Automatic screen rotation	✓	
Magnetism	✓	
Laser level	II	
Laser type	630-670nm, <1mW	
Max storage	100 units	
Auto laser-off	20s	
Auto power-off	180s	
Backlight time	60s	
Battery	3.7V 850mAh Li-ion	
Charge time	About 1.5 hours	
Charging specification	DC5V 0.75A Type-C	
Operation times at full charge	8000 times (Unidirectional); 5000 times (Bidirectional)	
Storage temperature	$-20^\circ\text{C}\sim 60^\circ\text{C}$	
Working temperature	$0^\circ\text{C}\sim 40^\circ\text{C}$	
Storage humidity	20%~80% RH	
Dimension	115x50x24.5mm	

\* "D" indicates the actual distance.

\*\* In harsh environment, such as: strong sunlight, excessively fluctuated ambient temperature, weak reflection effect of the object's surface and the low battery, a large error will occur in measurement results, so a reflecting plate is needed.

## Maintenance

- It is forbidden to store the instrument in a high temperature and humid environment for a long time. When the instrument is not used for a long time, please put the instrument in a cloth box and store it in a dry and cool place.
- Please keep the surface of the instrument clean. User can wipe the dust with a damp soft cloth. Do not clean the instrument with corrosive liquid. The laser window and focusing mirror can be wiped in the same way as the optical device.

## Packing List

When purchasing the instrument, please check carefully whether all accessories are complete according to the following list.

Item	Name	Unit	QTY	Note
1	Meter	PC	1	
2	Pouch	PC	1	
3	Strap	PC	1	
4	User manual	PC	1	
5	Color box	PC	1	
6	Type-C cable	PC	1	
7	Reflector	PC	1	Available for 100m only