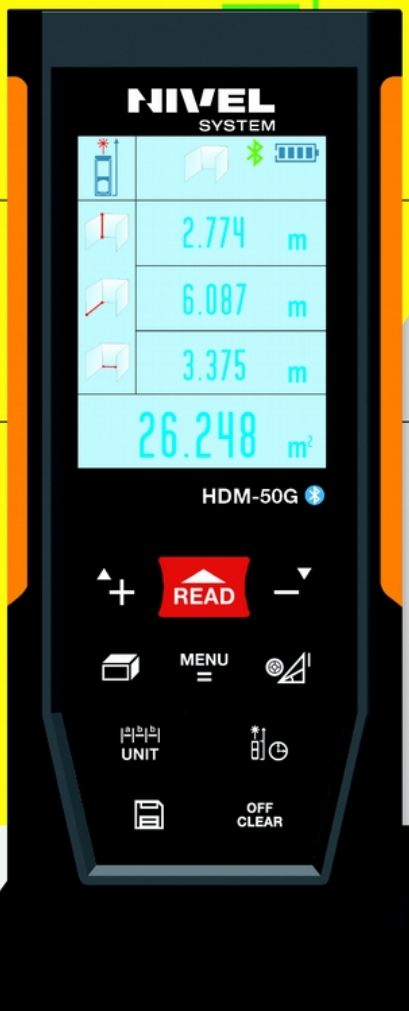
NIVEL SYSTEM

Measurement solutions
for construction

Laser distance meter

HDM-50G
HDM-70G
HDM-90G



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 guided could cause damage to the device, influence on measurement result or bodily injury to the user.**

⚠ **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 using by any irrelevant personnel.**

⚠ **It is strictly prohibited to shoot eyes or other parts of body with the laser; it is not allowed take the laser to shoot any objects' surface with strong reflecting.**

⚠ **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.**

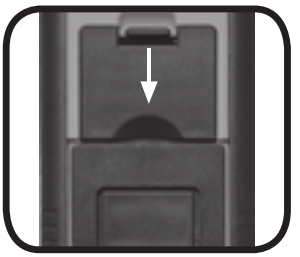
⚠ **Discarded batteries or meter device shall not be processed just like household garbage, please handle them in line with related law and regulations.**

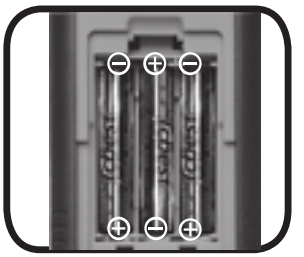
⚠ **Any quality issues or any questions on the meter, please contact local distributors or manufacturer in time, we are ready to offer solutions for you.**

Professional casts quality and good quality gets reputation

Battery Installation, Display, Keyboard

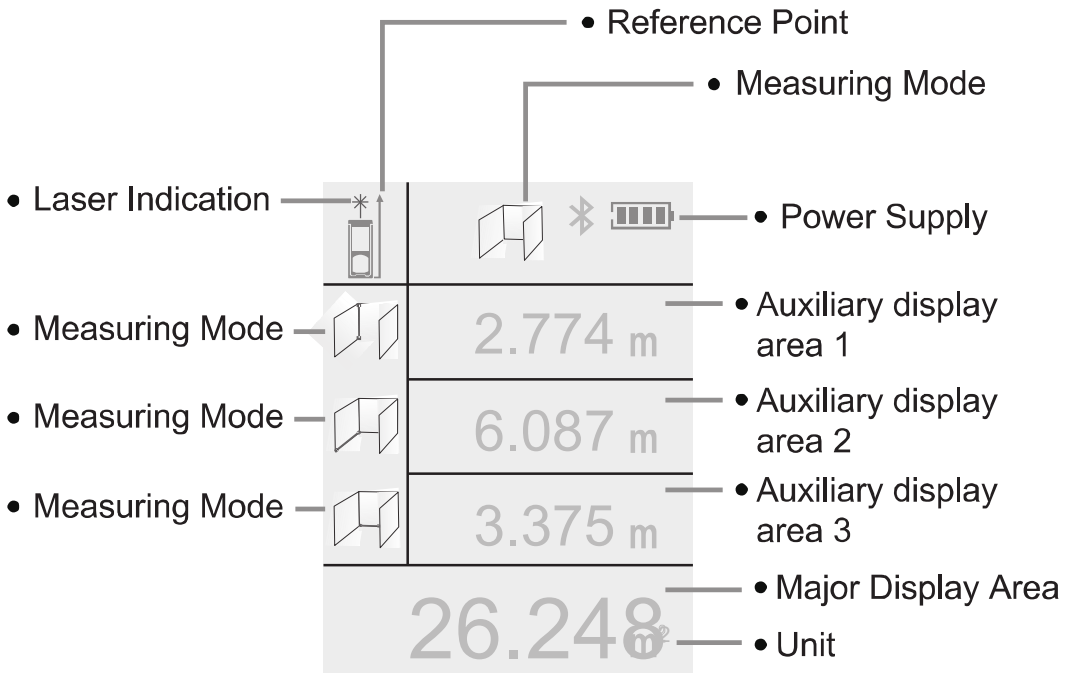
● Installation & Replacement Battery



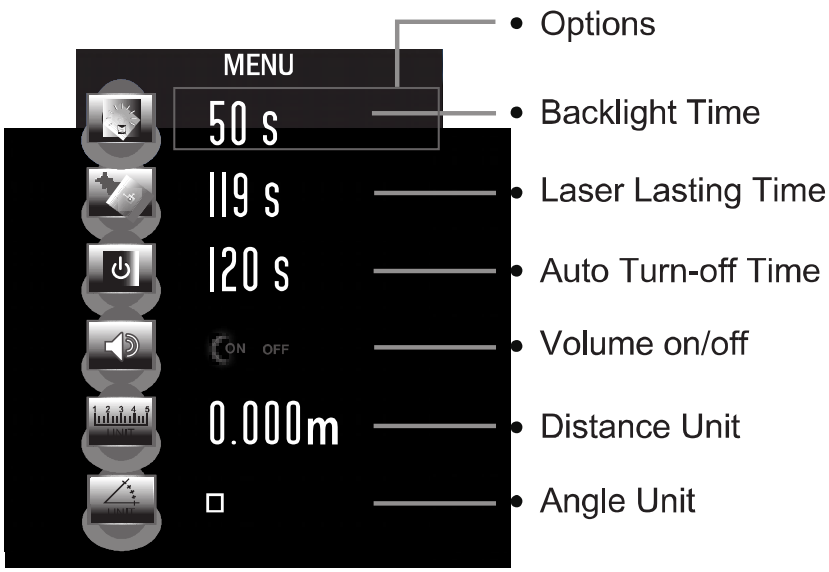


- Discharge the battery door on the back of device, and place battery according to correct polarity, then cover the battery door.
- 1.2V 800mAh AAA Ni-mh battery is recommended. An USB charging connector is included in the accessories bag. User can charge with mini USB, when the power is low.

● Display

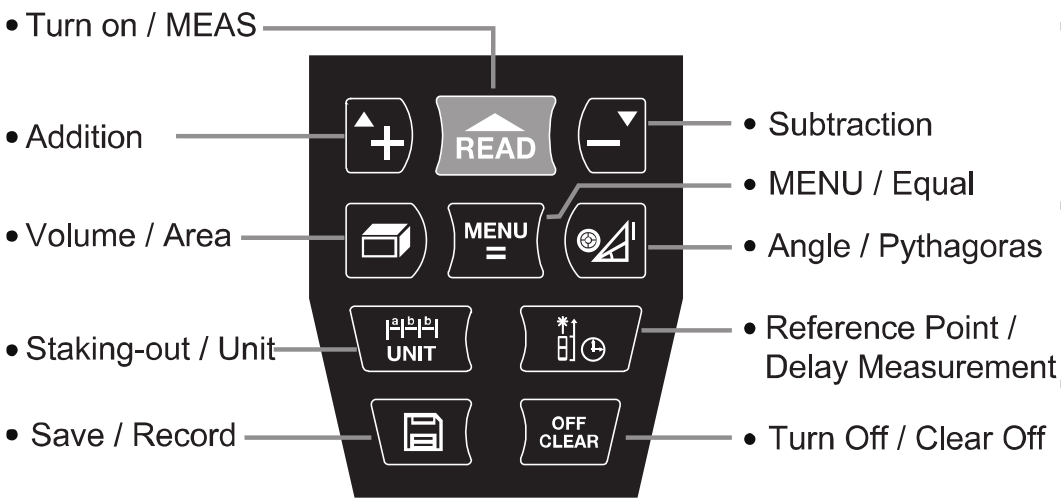


PIC 1 Major Interface



PIC 2 MENU

● Keyboard



PIC 3 Keyboard

Turn on & Basic Setting

● Turn on/off

Press button READ under on status, device and laser get starting simultaneously and stand by for measuring.

Turn off the device by long pressing button OFF CLEAR for 3 seconds under on status.When there is no operation, the device will be shut off in 150s. (Users can set this limited time in the menu, please refer to the MENU/Setting part)

- **Unit Setting**

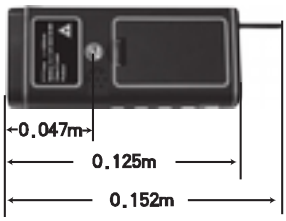
  Press button UNIT to reset current unit, the default unit is 0.000m, there are 8 units for selection.

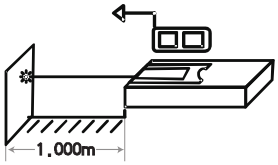
  Unit:

Item	Distance	Area	Volume
1	0.000m	0.000m^2	0.000m^3
2	0.00m	0.00m^2	0.00m^3
3	0.00ft	0.00ft^2	0.00ft^3
4	0.0in	0.00ft^2	0.00ft^3
5	0 1/32 in	0.00ft^2	0.00ft^3
6	0'00"1/32	0.00ft^2	0.00ft^3
7	0.000米	0.000米^2	0.000米^3
8	0.00米	0.00米^2	0.00米^3

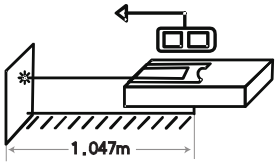
- **Reference Point Setting**

  The device get four reference points.
  System default reference point is bottom.
  Press to select the reference point.

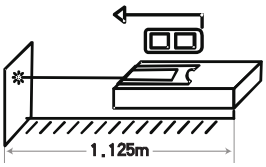




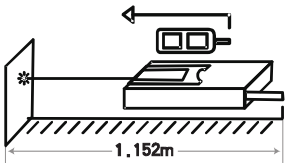
Front Point



Middle Point
(Screw Hole)



Bottom Point



End-piece Point

Distance, Area, Volume & Pythagoras

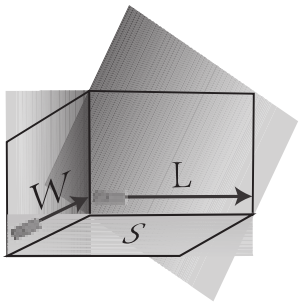
● Single Measurement

Press button READ under measuring mode, laser shoots and focuses the target.
Press button READ again for single measurement, result will be shown in the major display area.
The latest 3pcs of record will be shown in the auxiliary display area. Short press button OFF CLEAR to delete the history results.

● Continuous Measurement

The user can use this mode to find the target distance without frequent operation.
Long press button READ under measuring mode and enter continuous measuring mode.
Maximum and Minimum value will be shown on the screen. Present result displays in major display area.
Short press botton READ or OFF CLEAR to quit.

● Area Measurement



$$S = L \times W$$

Press button , shows on the screen.
Please follow the below instructions for area measuring:

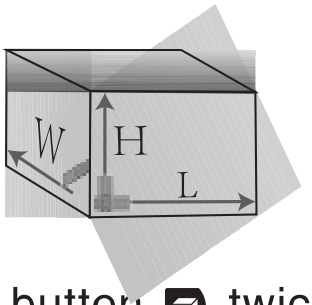
Press READ once for length;

Press READ again for width.

Calculate the perimeter automaticly.

The device calculates and shows the result in the major display area. Short press OFF CLEAR to clear off last result and measure again if necessary. Long press button to save the result.

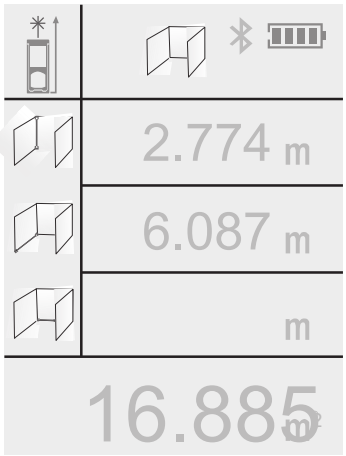
● Volume Measurement

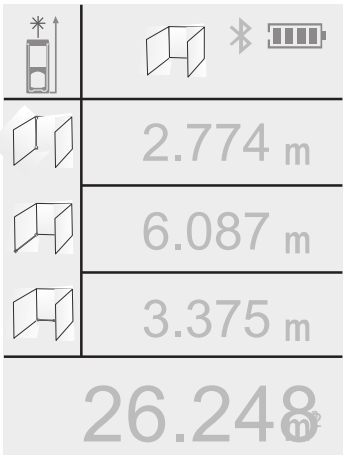


$$V = L \times W \times H$$

Short press button twice, screen shows .
Please follow the below instructions for area measuring:

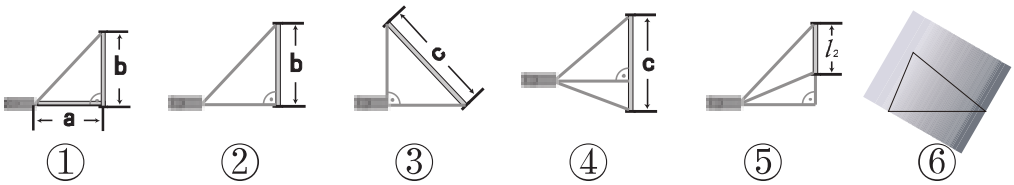
Press button READ for one edge (H)
Press button READ for the second edge (L)
Press button READ for the third edge (W)
It is unnecessary for user to measure according to this order. Device calculates the volume after measuring the third edge. Short press OFF CLEAR to clear off the last result and measure again when you make a wrong operation. Long press button to save the result.





- **Pythagoras Measurement**

  There are six triangle measurement methods:



They are:

① Calculate the length of two legs by measuring hypotenuse and angle.

② Calculate the other leg by measuring the hypotenuse and base leg of a right triangle.

③ Calculate the hypotenuse by measuring two legs of a right triangle.

④ Calculate the third side of a triangle by measuring the other two sides and the altitude.

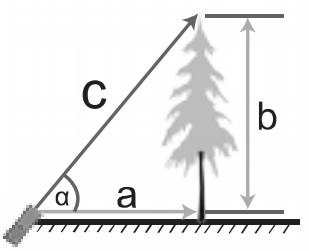
⑤ Calculate the length of the hightlight side by measuring hypotenuse, auxiliary line and base leg of the right triangle.

⑥ Calculate area of an irregular triangle by measuring the length of its three sides.

Press button to select the proper mode among these six.

Pythagoras Measurement must follow the instructions' order strictly.

1.Calculate two legs in a right triangle.

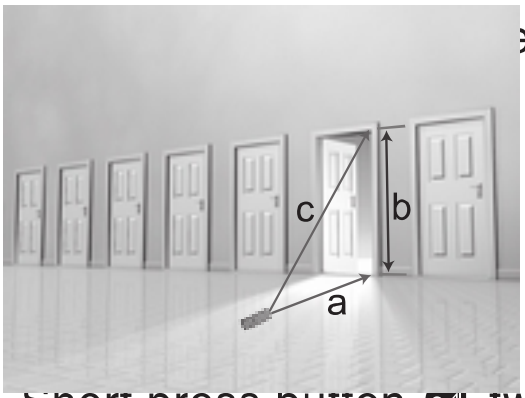


$a = c \times \cos\alpha$

$b = c \times \sin\alpha$

Press button once, screen shows ;

Press button READ for hypotenuse and dip angle.The results of b and a will be shown after measuring.



eg of a right triangle

$$b = \sqrt{c^2 - a^2}$$

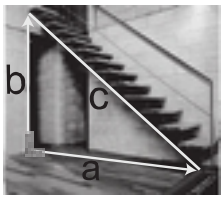
Short press button twice, screen shows ;

Press button READ for length of hypotenuse c;

Press button READ for length of one leg a;

Device calculates the length of the other leg b.

3. Calculate the hypotenuse of right triangle



$$c = \sqrt{a^2 + b^2}$$

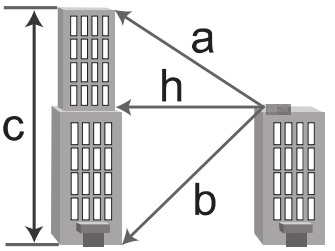
Short press button three times, screen shows ;

Press READ , measure the length of one leg a;

Press READ , measure the length of the other leg b;

Device calculates the length of hypotenuse c.

4. Calculate the third side of a triangle



$$c = \sqrt{a^2 - h^2} + \sqrt{b^2 - h^2}$$

Press button four times, screen shows ;

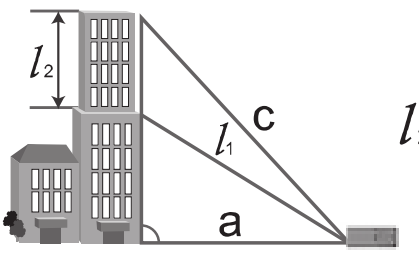
Press READ ,measure the length of one side a;

Press READ ,measure the length of another side h;

Press READ ,measure the length of the altitude b;

Device calculates the length of the third side c.

5. Calculate the highlight side H in one leg of a right triangle



$$l_2 = \sqrt{c^2 - a^2} - \sqrt{l_1^2 - a^2}$$

Press button five times, screen shows ;

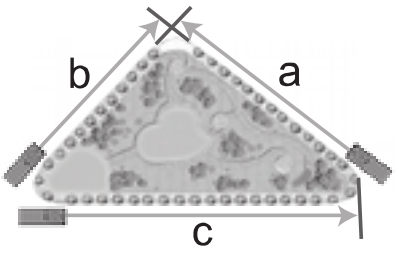
Press READ , measure the length of hypotenuse c;

Press READ , measure the length of the auxiliary line l_1 ;

Press READ , measure the length of another leg a;

Device calculates the length of the highlight line l_2.

6. Calculate the area of an irregular triangle



$$S = \sqrt{Lx(L-a)x(L-b)x(L-c)}$$

$$L = (a+b+c)/2$$

Press button six times, screen shows ;

Press button READ for first leg a;

Press button READ for second leg b;

Press button READ for third leg c;

The result of area S will be shown after measring.

ATTN: If the device shows "ERR 5" while measuring, that means the previous measring results are not accompany to the rule of triangle. For example, the hypotenuse is shorter than a leg. When there are results mistakes, the device will show "ERR 5" to alarm. In that case, users need to measure again.

If user gets a wrong result in last measurement, short press button OFF CLEAR to return to the last measurement and measure again. Long press button to save the result.

Calculation

Distance Addition

Step 1 Press button + when you get the first distance result;

Step 2 Press button READ to get the second result;

The SUM shows in the major display area.

Repeat Step 1 and Step 2 to continue the summation.

Distance Substration

Step 1 Press button − when you get the first distance result;

Step 2 Press button READ to get the second result;

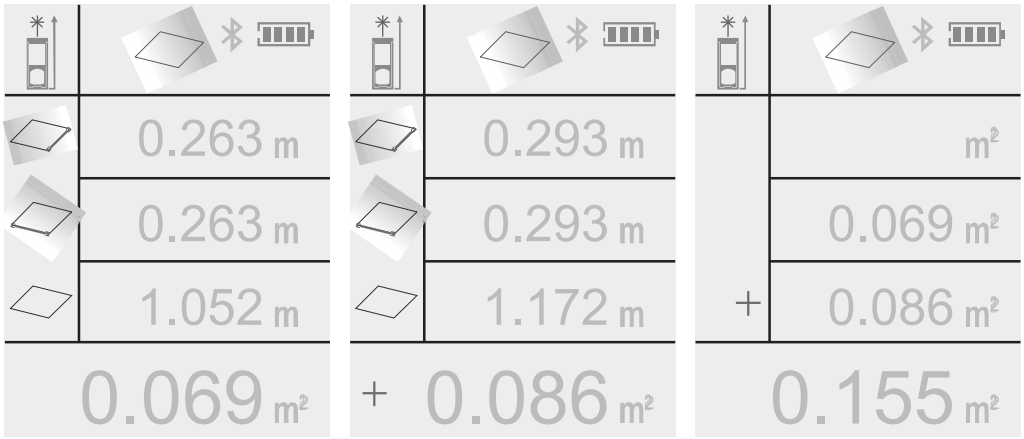
The difference shows in the major display area.

Repeat Step 1 and Step 2 to continue the substration.

ATTN: User can short press button OFF CLEAR to cancel the last movement while addition or sustration.

Short press twice the button OFF CLEAR to exit.

Area Addition and Substration



PIC 4 First Area Result PIC 5 Second Area Result PIC 6 SUM

Step 1 Get first area result as PIC 4.

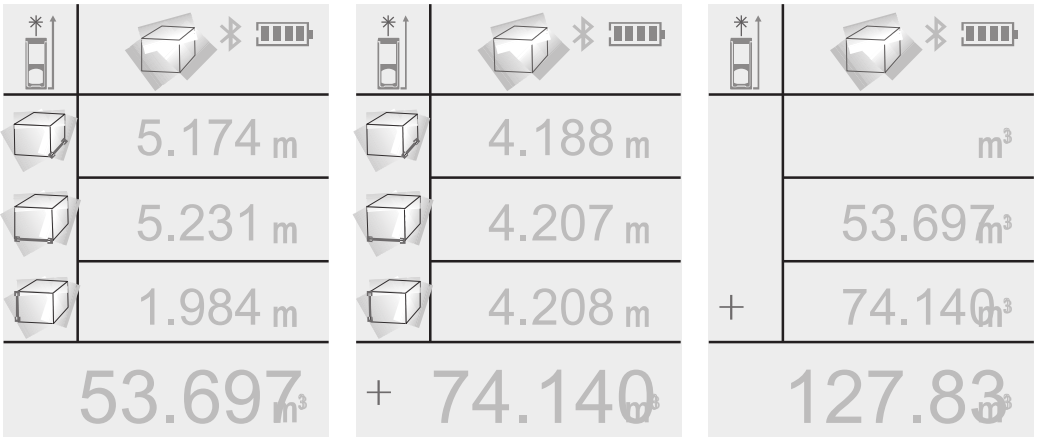
Step 2 Short press button , and then repeat the area measurement movement to get the second result of area as PIC 5.

Step 3 Short press button MENU , device calculates the SUM and shows in the major display area as PIC 6.

Repeat the movement of step 2 for more areas addition before step 3, device will calculates SUM for all areas.

The movements of Substration are similar to Addition.

Volume Addition and Substration



PIC 7 First Volume Result

PIC 8 Second Volume Result

PIC 9 SUM

Step 1 Get first volume result as PIC 7.

Step 2 Short press button , and then repeat the volume measurement movement to get the second result of volume as PIC 8.

Step 3 Short press button MENU , device calculates the SUM and shows in the major display area as PIC 9.

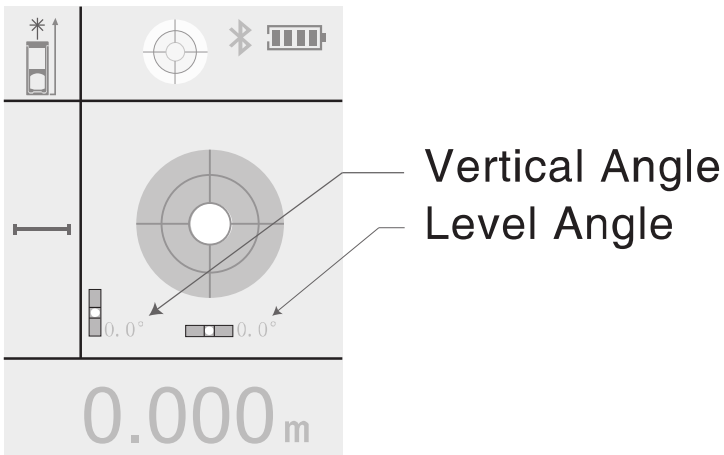
Repeat the movement of step 2 for more areas addition before step 3, device will calculates SUM for all areas.

The movements of Substration are similar to Addition.

Multi-direction Electronic Level Bubble, Delay Measurement, Staking-out and Angle Measurement

- **Multi-direction Electronic Level Bubble**

Long press button , screen shows:

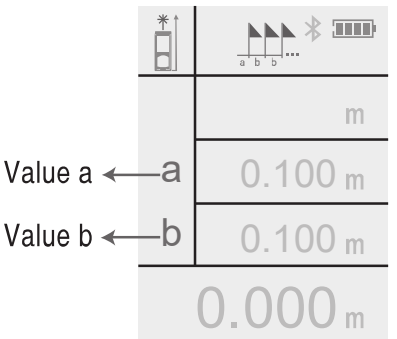


Press button OFF CLEAR to exit.

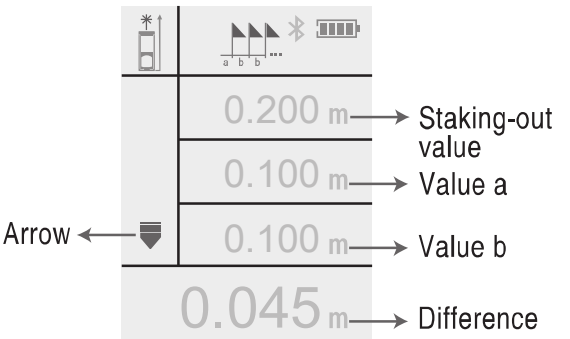
Delay Measurement

Long press button , delay time shows on the top of screen in Seconds. Short press + and − to adjust the time. Max value is 60s, Min value is 5S. Then short press button READ to start the delay measuring function.

● Staking-out



PIC 10



PIC 11

User can use staking-out function to find the position which match the setting distance.

1. Long press button UNIT, the device shows as PIC 10;

2. Set the value:

Press + and − to adjust the value of a. Press button READ when a is confirmed.

Press + and − to adjust the value of b. Press button READ when b is confirmed.

3. Arrows:

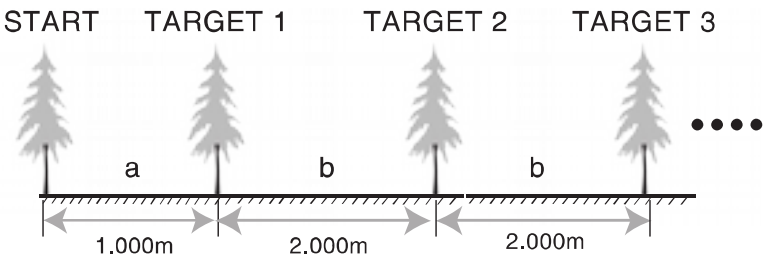
:Please move back;

:Please move on;

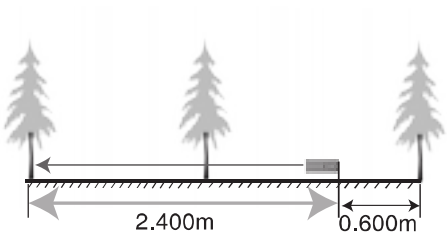
:Match the postion.

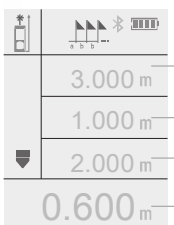
4. Short press button OFF CLEAR to exit.

5.Function Description



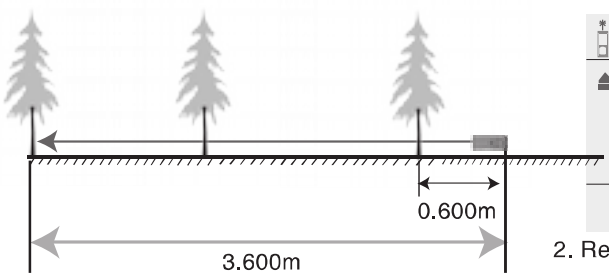
a. 1.000m
b. 2.000m
"a" and "b" are set by user.
"a" and "b" can be in same value or not.

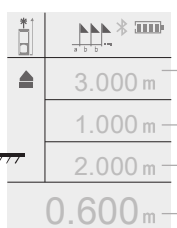




The distance between the start to target 2.
a
b
Move the device back 0.6m to Target 2

1. Real Distance = 2.4





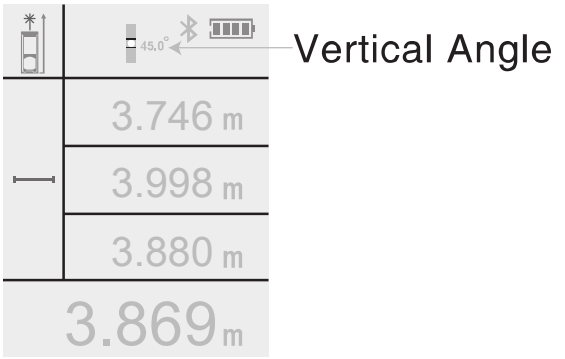
The distance between the start to target 2.
a
b
Move the device forward 0.6m to Target 2

2. Real Ditance = 3.6

- **Angle value shows on the top of the screen.**

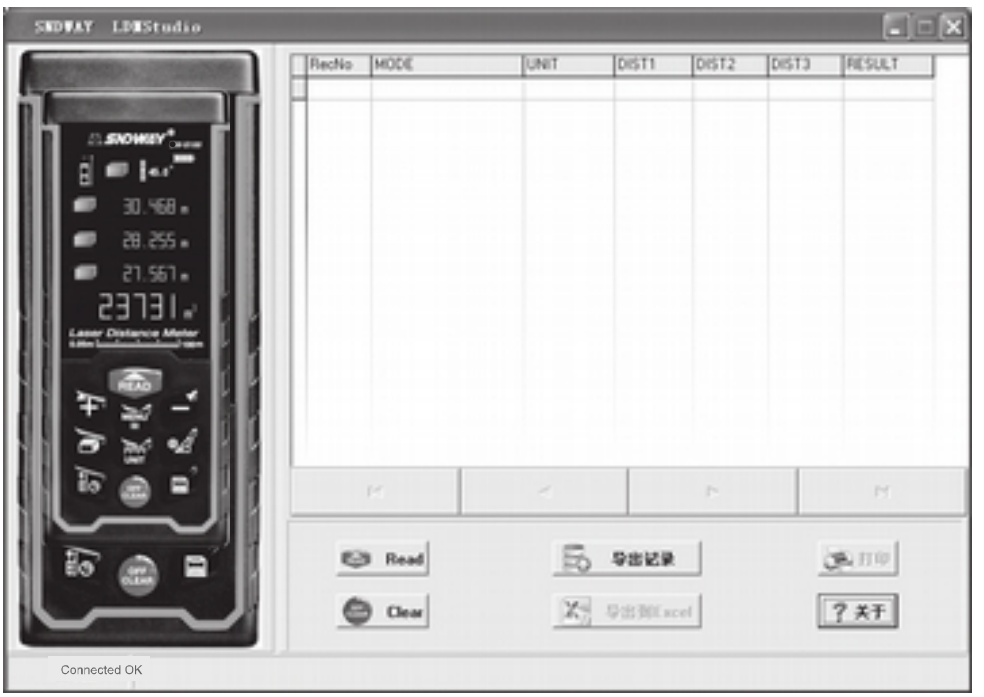
The range of angle is -90.0° ~ 90.0°

Two Units of Angle: ° and % (Slope)



- **Connect to Computer**

User can transfer the records from the device to the computer with USB connector. User need to install the software "LDM Studio" from the disc which is offered with the device. Then user can upload the records to EXCEL. The software interface is as below:



PIC 12

The device is offered with opened USB HID for users to do further development. Please check the disc for the whole agreement.
DOC: USB-HID Command List-EN vr.docx

- **Software Installation:**

1)Open the folder "LDMStudio_setup" in the disc. Double click "setup.exe" to install the software. Operate following the instructions in chapter 2 "One-Key Installation" in "readme.docx" or "readme.pdf".

2)Connect the device to the computer with USB afterinstallation. When open the software, it shows the interface of PIC 12. If it is successfully connected, it will shows "**Connected**" at the left bottom of the interface.

3) Click  or  to control or clear the records.

4) Click  to upload the records to the computer. Click  to get the records in EXCEL. Click  to print the records.

MENU Setting

Enter and Exit the MENU

Press button MENU to enter the Menu Setting interface.
User can exit by short press OFF CLEAR , the alteration can be taken effect but not recorded.
User can also exit by short press , the alteration can be taken effect and recorded.

Baic Operation

There is a red option frame to show your seletion. (PIC 2).
Move the red option frame up and down by button and .
Short press MENU , then the red frame become green.
Press or to adjust the parameter of your selected item.

Items and Options

There are totally 7 items in 2 pages in the MENU.

Item	Description	Options
	Backlight	5s～60s
	Laser Lasting	20s～120s
	Auto Power-off	100s～300s
	Tone	
	Distance Unit	1：0.000m　2：0.00m 3：0.0in　4：in 1/32 5：0'00'1/32　6：0.00ft 7：0.000米　8：0.00米
	Angle Unit	1：o ：degree 2：100% ：Slope
	Calibration	−0.009m ～ +0.009m

ATTN: Calibration function may affect precision of the device, so this item cannot be adjust under default state. User need to follow the below steps for the calibration:

Step 1 Turn off the device;

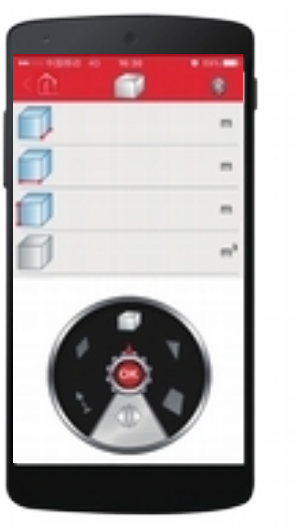
Step 2 Press the button and hold. Short press button READ , then release it. Release the button till the device enter the main interface;

Step 3 Short press button MENU for MENU setting. Now it is free for the calibration.

APP (Only Available for Models with Bluetooth Function)

The meter provides Bluetooth 4.0/. Please download the APP by searching "LDM Studio" in your APP store.

The meter can be controled by this APP on smartphone. Thie APP can help you do same simple drawing, upload measuring data, mark distance on a site picture, and so on.



Battery

The device is accompanied with rechargable batteries and USB charging connector. Please check the batteries before charging to make sure the batteries in the device are rechargable. It is forbidden to charge nonrechargable batteries.

The icon  will roll on the right top of the screen while charging. When the charging is finished, the icon  will turn green.

ATTN: We suggest the user to use our standard USB charging connector for charging.

Instrument Maintenance:

1) The meter should not be stored in high temperature and strong humidity environment for long time;
2) If it is not used very often, please take out the battery and place the meter in the allocated potable bag and store in cool and dry place.
3) Please keep the device surface clean. Wet soft cloth is applied to clean dust, but erosion liquid is never allowed to use for the meter maintenance.
4) Laser output window and its focus lens can be maintained according to maintenance procedures for optical device.

Delivery Package

Please check if the accessories are matched the below list before buying.

Item	Contents	Unite	QTY	Remark
1	Laser distance meter	pc	1	
2	Pounch	pc	1	
3	Hand Strap	pc	1	
4	Rechargable Battery	pc	3	
5	USB Connector	pc	1	
6	Disc	pc	1	
7	Reflector	pc	1	Only for 100m
8	User' s manual	pc	1	
9	Giftbox	pc	1	

Tips

You may get some warning information as below:

Info message	Cause & Solution
ERR 1	Received signal is too weak. Chose the surface with stronger reflectance. Use the reflector.
ERR 2	Received signal is too strong. Chose the surface with weaker reflectance. Use the reflector.
ERR 3	Low power. Change or recharge the batteries.
ERR 4	Fail of memorizer. Please contact the manufacturer.
ERR 5	Pythagoras measuring error. Please re-measure.
ERR 6	Exceed the measuring range.
ERR 8	Fail of tilt. Please contact the manufacturer.

Specifications

Item				
Working range	50m	70m	90m	
Smallest unit displayed	1mm			
Measuring accuracy	± 2 mm **			
Laser	class II, < 1 mW			
Laser wavelength	535 nm green			
Continuous distance measuring (tracking)	Yes			
Area / volume	Yes			
Pythagoras measuring	Yes			
Length/Area/Volume Addition/Subtraction	Yes			
MAX & MIN Value	Yes			
Skating-out	Yes			
Delay Measurement	Yes			
Self-Calibration	Yes			
Angle of Tilt	±90°			
Multi-direction Electronic Level Bubble	Yes			
Backlight	Yes			
Record	100 pcs			
USB Connector	Yes			
Auto Laser off	20~120 s			
Auto Switch off	100 ~300s			
Storage temperature range	-20 ... +60 °C			
Working range	0 ... +40 °C			
Storage Humidity	20%-80% RH			
Power supply	Ni-mh 3x1.2V 800mAh			
Dimensions	125x54x27mm			

** Use a reflector to increase the measurement range during daylight or if the target has poor reflection properties. Low power supply can also cause wrong measuring results.

Service, support

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