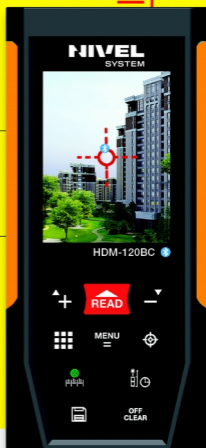
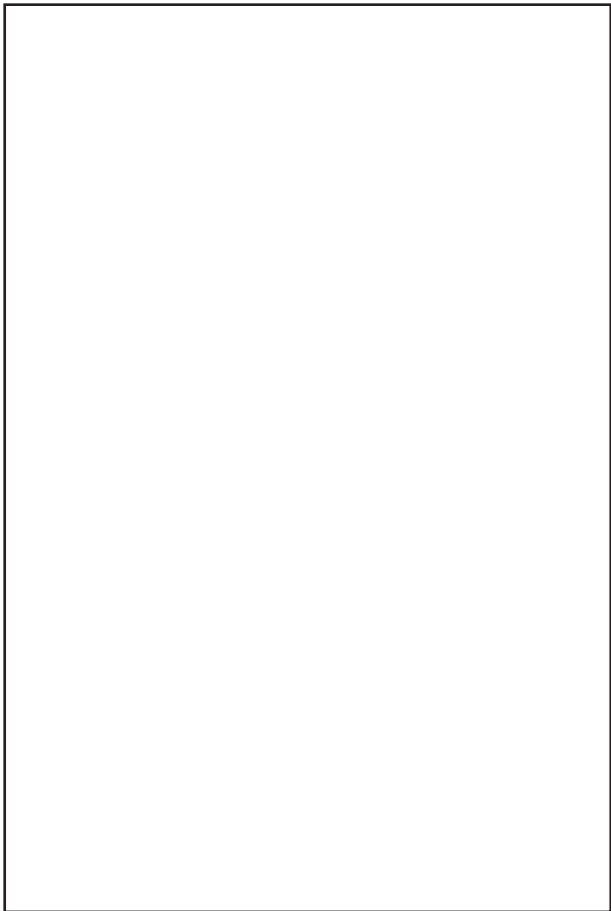


Laser distance meter **HDM-120BC**



Manual







Safety Regulations

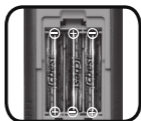
Please read the safety regulations and operation guide carefully before operating.

- ⚠ 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

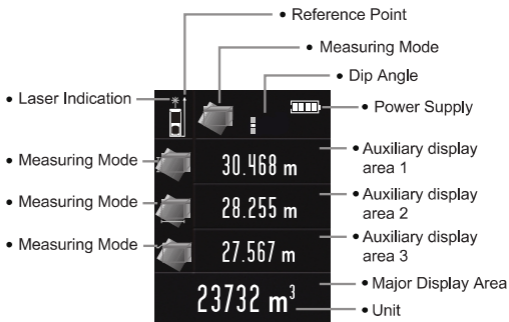
Battery Installation, Display, Keyboard

● Installation & Replacement Battery

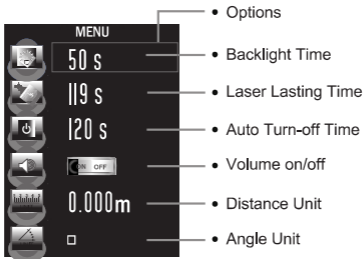


- Discharge the battery door on the back of device, and place battery according to correct polarity, then cover the battery door.
- 1.2V 800mAh AAA Ni-mh battery is recommended. An USB charging connector is included in the accessories bag. User can charge with mini USB, when the power is low.

● Display

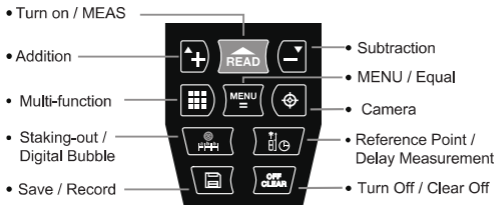


PIC 1 Major Interface



PIC 2 MENU


● Keyboard




PIC 3 Keyboard








Turn on & Basic Setting

● Turn on/off

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

Turn off the device by long pressing button  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

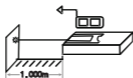
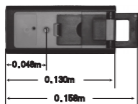
Short press button , enter setting menu. Press button  or  to move the red frame to the item , then press , the frame turns to be green, user can select the unit by press button  or . The default unit is 0.000m, there are 8 units for selection.

Unit:

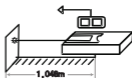
Item	Distance	Area	Volume
1	0.000m	0.000m ²	0.000m ³
2	0.00m	0.00m ²	0.00m ³
3	0.00ft	0.00ft ²	0.00ft ³
4	0.0in	0.00ft ²	0.00ft ³
5	0 1/32 in	0.00ft ²	0.00ft ³
6	0'00 "1/32	0.00ft ²	0.00ft ³
7	0.000米	0.000米 ²	0.000米 ³
8	0.00米	0.00米 ²	0.00米 ³

● Reference Point Setting

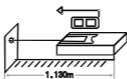
The device get four reference points. System default reference point is bottom. Press  to select the reference point.



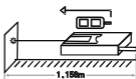
Front Point



Middle Point
(Screw Hole)




Bottom Point





End-piece Point

Distance, Area, Volume & Pythagoras

● Single Measurement

Press button  under measuring mode, laser shoots and focuses the target.

Press button  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  to delete the history results.

● Continuous Measurement

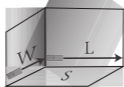
The user can use this mode to find the target distance without frequent operation.

Long press button  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 button  or  to quit.

● Area Measurement





$$S = L \times W$$

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

 Press button  once for length;



 Press button  again for width.

The device calculates and shows the result in the major display area. Short press  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  for one edge (H)

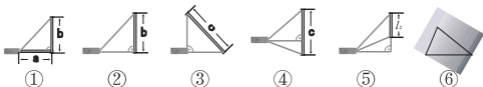
 Press button  for the second edge (L)

 Press button  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  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:



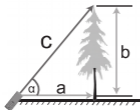
They are:

- 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 highlight 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  three times, screen shows  ;
 Press button  for hypotenuse and dip angle. The results of b and a will be shown after measuring.



Length of a right triangle 







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


Short press button  four times, screen shows  ;
 Press button  for length of hypotenuse c ;
 Press button  for length of one leg a ;
 Device calculates the length of the other leg b.

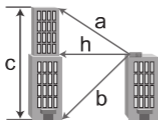
3. Calculate the hypotenuse of right triangle 





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



Short press button  five times, screen shows  ;
 Press  , measure the length of one leg a ;
 Press  , 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  six times, screen shows  ;

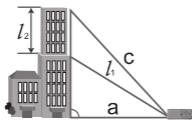
 Press , measure the length of one side a;

 Press , measure the length of another side h;

 Press , 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  seven times, screen shows  ;

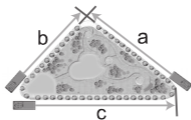
 Press , measure the length of hypotenuse c;

 Press , measure the length of the auxiliary line l_1 ;

 Press , 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 eight times, screen shows ;

Press button for first leg a;

Press button for second leg b;

Press button for third leg c;

The result of area S will be shown after measuring.


ATTN: If the device shows "ERR 5" while measuring, that means the previous measuring 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 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  to get the second result;
The SUM shows in the major display area.
Repeat Step 1 and Step 2 to continue the summation.

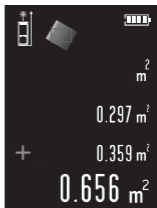
Distance Substration

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

Step 2 Press button  to get the second result;
The difference shows in the major display area.
Repeat Step 1 and Step 2 to continue the substraction.

ATTN: User can short press button  to cancel the last movement while addition or sustration.
Short press twice the button  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 , 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 calculate 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 , device calculates the SUM and shows in the major display area as PIC 9.

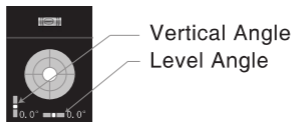
Repeat the movement of step 2 for more areas addition before step 3, device will calculate SUM for all areas.

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:










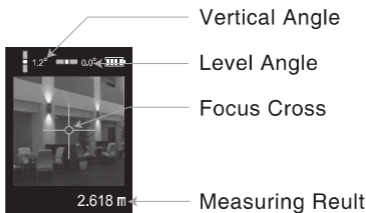
Press button  to exit.

● **Camera**

When users cannot find the laser spot under strong sunshine, please turn on the camera to help you to make the measurement.





1. Short press button  to turn on the camera under single measuring-stay mode;

2. Make the cross which is on the screen exactly point to your target, then start measuring (Please refer to the Sigle Measuring capter);
3. Short press button  once, or short press button  to exit the camera. If there is measuring result, short press button  twice to exit;
4. Short press button  to turn on the camera under Area, Volume or Pythagoras mode with the laser on. Short press button  to exit and the measuring result will be shown on the screen.
5. Continuous measuring with camera: turn on the camera, then long press the button  to enter continuous measuring mode. When find the target, short press button  to stop continuous measuring. The measuring result will be shown on the screen.

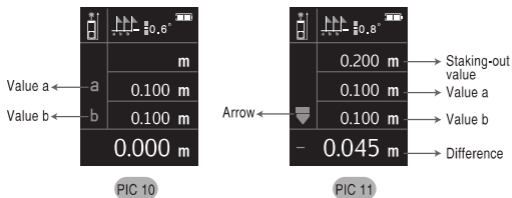


Note: Camera measuring assistant is only useful when the distance is more than 10 meters.

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 3S. Then short press button  to start the delay measuring function.




● Staking-out






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

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

2. Set the value:

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

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

3. Arrows:

▼: Please move back;

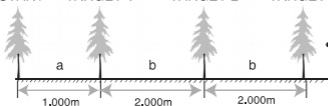
▲: Please move on;

⌂: Match the position.

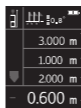
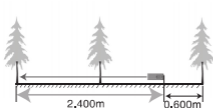
4. Short press button to exit.

5. Function Description

START TARGET 1 TARGET 2 TARGET 3



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



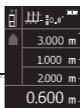
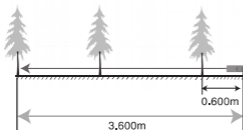
The distance between the start to target 2.

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

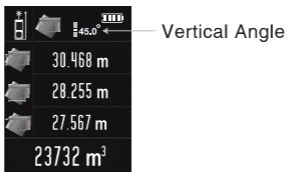
Move the device forward 0.6m to Target 2

2. Real Distance = 3.6

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

The range of angle is $-90.0^{\circ} \sim 90.0^{\circ}$

Two Units of Angle: $^{\circ}$ 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

类型	大小
文件夹	
应用程序	4,038 KB

LDMStudio



Laser Distance Meter
0.05m ~ 120m

RecNo	MODE	UNIT	DIST1	DIST2	DIST3	RESULT
1	Distance	m	0.000 m	0.000 m	0.998 m	0.999 m
2	Distance	m	0.000 m	0.000 m	0.000 m	3.307 m
3	Distance Addition	m	0.000 m	3.307 m	3.760 m	7.067 m
4	Distance Substration	m	0.000 m	3.651 m	2.956 m	0.695 m
5	Area	m	3.074 m	3.014 m	0.000 m	9.265 m2
6	Volume	m	2.847 m	3.068 m	3.407 m	29.759 m3
7	Pythagorean 1 a&b	m	41.2 °C	3.226 m	2.427 m	2.124 m
8	Pythagorean 2 b	m	3.178 m	1.633 m	0.000 m	2.726 m
9	Pythagorean 3 c1	m	0.156 m	3.808 m	0.000 m	3.811 m
10	Pythagorean 4 c2	m	3.304 m	1.676 m	3.821 m	6.281 m
11	Pythagorean 5 L2	m	2.886 m	2.474 m	0.156 m	0.413 m
12	Pythagorean 6 S	m	3.208 m	3.166 m	3.055 m	4.272 m2
▶ 13	Digital bubble	m	0.000 m	0.000 m	0.000 m	3.742 m



print the records

Read Export Records Print
Clear Export to Excel About



Connected OK ATR013# Instructions sent successfully

Baic Operation

There is a red option frame to show your selection. (PIC 2).









Move the red option frame up and down by button  and .

Short press , 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: ° : 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 , then release it. Release the button  till the device enter the main interface;

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

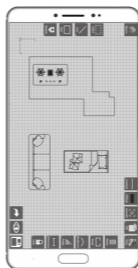
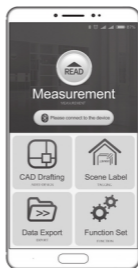
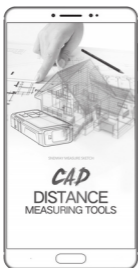
APP

*** This function is just applied fo Bluetooth version.**

This device is company with professional APP, which can help user to control the device, do CAD drawing, measure on photo by smart phone. Download and Install the APP:



Andriod: Please search "App for HDM series" in <http://nivelsystem.com>, then install the APP accordingly.

IOS: Please search "LDM STUDIO PRO" in APP store and install the APP accordingly.



Battery

The device is accompanied with rechargeable batteries and USB charging connector. Please check the batteries before charging to make sure the batteries in the device are rechargeable. It is forbidden to charge nonrechargeable 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	Pouch	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	
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	120m
Smallest unit displayed	1mm
Measuring accuracy	± 2 mm **
Laser	class II, < 1 mW
Laser wavelength	635nm
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
Auxiliary Sight with Camera	Yes
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	RH85%
Power supply	Ni-mh 3x1.2V 800mAh
Dimensions	130x56x29mm

Note: Bluetooth function for option.


** 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.

* Typical Tolerance: $\pm 2\text{mm}$, when reflectivity 100% (white surface), environment light $< 2000\text{ LUX}$.
25 °C Tolerance is usually affected by the distance, reflectivity, and environment light etc. It probably gets tolerance around $\pm(2\text{mm}+0.2\text{mm/m})$.

nivelsystem.com

Service, support

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00-716 Warsaw, Poland

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info@nivelsystem.com