



深达威®手持式激光测距仪

Laser Distance Meter

用户手册

User Manual



SW-MS50

SW-MS70

SW-MS100



产品执行标准: GB/T 14267-2009



2024L401-44

安全条例

初次使用仪器前, 请先仔细阅读安全条款和操作指南

- ⚠ 在使用仪器之前请仔细阅读本手册中的所有操作指南和安全条例, 没有按照本手册所指引的操作方法使用仪器有可能会造成仪器的损害、影响测量精度、对使用者或第三者的人身伤害。
- ⚠ 不要用任何方式自行打开或修理仪器, 严禁非法改装或改变仪器激光发射器的性能。请妥善保管仪器, 不要放置在儿童可以接触到的地方, 避免无关人员的使用。
- ⚠ 严禁用仪器激光器照射自己或他人的眼睛及身体其他部位, 严禁将激光器照射在高反光的物体表面上。
- ⚠ 仪器电磁辐射可能对其他设备和装置造成干扰, 请不要在飞机或医疗设备附近使用本仪器, 不要在易燃、易爆的环境中使用仪器。
- ⚠ 仪器更换的废旧电池和报废的仪器不可与生活垃圾一同处理, 请按国家或者当地的相关法律规定处理废旧电池和报废仪器。
- ⚠ 仪器出现任何的质量问题, 或对使用仪器有任何疑问时请及时联系当地经销商或深达威仪器厂家, 我们将第一时间为您解决。



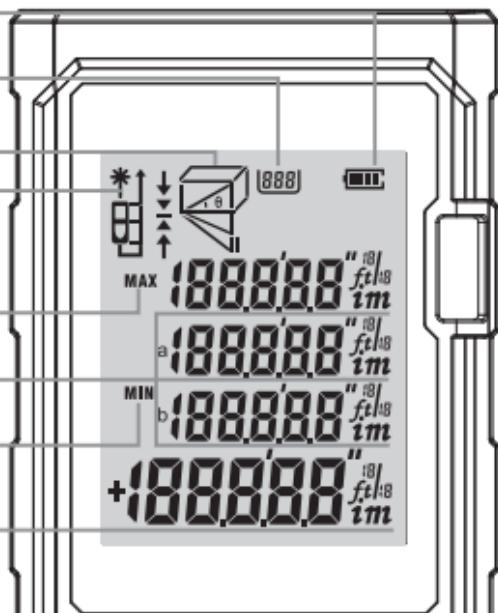
感谢您购买 **深达威[®]仪器** 手持式激光测距仪系列产品!

专业铸造品质 品质成就品牌

显示屏、按键

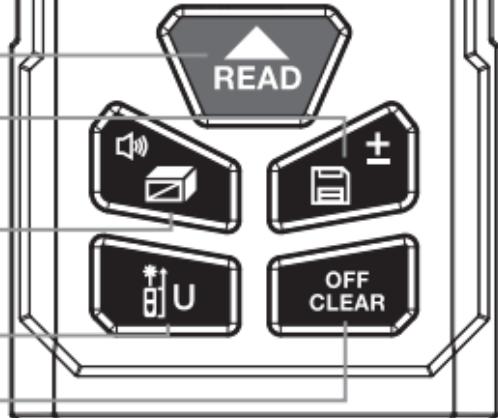
● 显示屏

- 电量指示
- 数据存储指示
- 长度/面积/体积/
三角测量模式
- 激光发射指示
- 最大值指示
- 辅显示区
- 最小值指示
- 主显示区



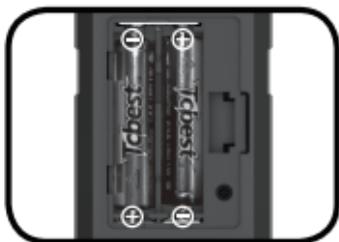
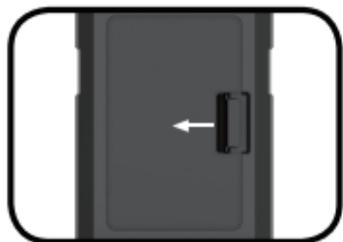
● 按键

- 开机、测量键
- 累加/累减/
存储键
- 面积/体积/
三角模式/声音键
- 测量基准/
单位选择
- 关机、清除键



安装电池

● 安装更换电池



- 打开仪器背部的电池门，按照极性指示正确放入电池，并关闭电池门。
- 仪器使用1.5V AAA的电池。
- 长时间不使用仪器时，请取出电池，以避免电池腐蚀仪器主机。

启动仪器、功能设置

● 启动仪器和关闭仪器

关机状态下，按 **READ** 键，仪器和激光同时启动，仪器进入待测模式。

开机状态下，长按 **OFF/CLEAR** 键3秒关闭仪器。150秒内未对仪器进行任何操作，仪器将自动关闭。

● 单位设定

长按 **単** 键，进入测量单位调整状态，可重置当前测量单位，本机默认的单位为：0.000m，该仪器提供了6种单位可供选择。

测量单位：

	长 度	面 积	体 积
1	0.000 m	0.000 m ²	0.000 m ³
2	0.00 m	0.00 m ²	0.00 m ³
3	0.0 in	0.00 ft ²	0.00 ft ³
4	0 1/16 in	0.00 ft ²	0.00 ft ³
5	0'00" 1/16	0.00 ft ²	0.00 ft ³
6	0.00 ft	0.00 ft ²	0.00 ft ³

● 测量基准设置

短按  键进行设置前端基准和末端基准的相互转换，系统默认为末端基准。

● 背光灯开启/关闭

本仪器背光灯为自动开和关。仪器在键入任一按键后，背光灯会持续打开15秒，15秒后，仪器无操作将自动关闭背光灯，以节省电源。

● 声音开启/关闭

长按  键可关闭或打开声音控制。

自助校准功能

为保证仪器的精准度，提供了自助校准功能。

校准方法：在关机状态下，持续按住  键，再按  键开机，松开  键，直到屏幕出现 ‘CAL’ 下端有闪烁的数字，进入自助校准模式。此时用户可根据仪器的误差用   键对这个数值进行调整。

调整范围为：-9~9mm。

例如：实际距离为3.780m

若本机测量值为3.778m，比实际值小2mm，则可进入校准模式，用  键将校准值在现有基础上上调2mm。

若本机测量值为3.783m，比实际值大3mm，则可进入校准模式，用  键将校准值在现有基础上下调3mm。

调整完毕后，按  键保存校准结果。

单次测量

待测模式下短按  键，仪器激光发射，锁定测量点。再按  键进行单次距离数据的测量，测量结果显示在主显示区。

连续测量

待测模式下长按  键，进入连续测量状态，屏幕上辅助显示区会显示此次连续测量过程中的最大测量值和最小值。

主显示区会显示当前测量值，短按  键或  键退出连续测量模式。

面积测量

按  键一次，屏幕会显示 ，长方形一条边闪烁。

根据提示完成下列操作：

按  键进行第一条边的测量（长）

按  键进行第二条边的测量（宽）

仪器会自动进行面积运算，结果显示在主显示区。

辅助显示区显示长方形的长和宽的测量值。

在测量过程中，还可以键入  清除本次测量结果重新测量。

按  键，退出面积测量状态，进入长度测量模式。

体积测量

按  键二次，系统进入体积测量状态，仪器进入体积状态，屏幕上会有一个立方体闪烁 ，根据提示完成下列操作：

按  键进行第一条边的测量（长）

按  键进行第二条边的测量（宽）

按  键进行第三条边的测量（高）

仪器会自动进行体积运算，结果显示在主显示区。

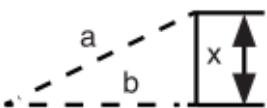
辅助显示区显示立方体的长宽高的测量值。

在测量过程中，还可以键入  清除本次测量结果重新测量。

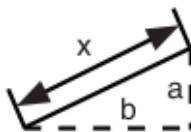
按  键，退出体积测量状态，进入长度测量模式。

勾股定理间接测量

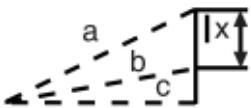
①



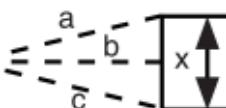
②



③



④



仪器预设有四种利用勾股定理测量三角形单边距离模式，方便用户在特定复杂环境下进行间接测量。

① 测斜边和底，间接测量高度



仪器短按 键三次进入该三角间接测量模式：

按 键依屏幕提示先测出虚线斜边的长度(a)

按 键测出虚线直角边(底边)的长度(b)

仪器自动计算实线直角边(高)的长度(x)

② 测量直角三角形两直角边，间接测量斜边长度



点击 键四次，屏幕显示： 直角边闪烁

按 键依屏幕提示测出一条虚线的长度(a)

按 键测出另一条虚线角边的长度(b)

仪器自动计算实线斜边的长度(x)

③ 点击  键五次，屏幕显示： 斜边闪烁
按  键依屏幕提示先测出一条虚线的长度(a)
按  键测出中间一条虚线边的长度(b)
按  键测出另一条虚线边的长度(c)
仪器自动计算出实线三角形一条边的长度(x)

④ 点击  键六次，屏幕显示： 斜边闪烁
按  键依屏幕提示测出一条虚线边的长度(a)
按  键测出如图虚线边的长度(b)
按  键测出如图另一条虚线斜边的长度(c)
仪器自动计算出实线直角边的长度(x)

勾股测量模式下，直角边必须小于斜边长度仪器才能计算，否则仪器会显示错误信号提示。在勾股测量模式下，为保证测量的精度，须确保从同一个起始点测量，并按斜边、直角边测量顺序测量。

加减测量功能

单段距离测量可通过加/减运算进行累加或累减操作。用户在测量单段距离得到一次测量结果后，再通过  键进入累加累减功能选择，短按  键，当屏幕测量主显示区出现“+”，进入累加测量模式，屏幕显示上次测量值与当次测量值的累加值。

短按  键，当屏幕测量主显示区出现“-”，进入累减测量模式，屏幕显示上次测量值与当次测量值的差值。

不仅距离可累加累减，面积和体积也可进行累加累减。下面举例说明面积的累加累减功能，体积的累加累减与此类似。

面积累加：测量第一个面积，得到结果如下图1所示。然后按下  键，再测量第二个面积，得到结果如下图2所示，在左下角会显示一个加号。最后，按下  键得到两次面积求和的结果，结果如图3所示。

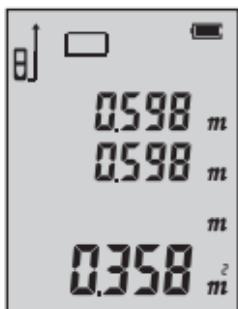


图1

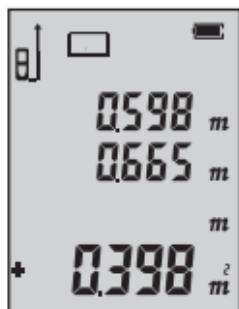


图2

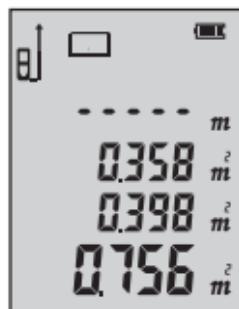


图3

测量记录存储功能

测量模式下，当前数据有效时，仪器将自动存储到内存中，屏幕顶部记录号  不断累加。

● 浏览/删除记录：

长按  键，查询已储存的测量数据，用  键向后翻记录，用  向前翻记录。在查看记录过程中，长按  键清除所有记录。可短按  键或  键退出该状态。

提示信息

使用过程中，主显示区可能会出现如下提示信息：

信息	原因	解决方法
Err	超出距离测量范围	让仪器在量程范围内使用
Err1	信号过弱	测量反射能力强的目标点
Err2	信号过强	测量反射能力弱的目标点
Err3	电池电压过低	更换电池
Err4	超出工作温度范围	让仪器在指定环境中使用
Err5	勾股测量违规	重新测量，确保斜边大于直角边

技术参数

项目	SW-MS50	SW-MS70	SW-MS100
距离测量范围	0.05-50m	0.05-70m	0.05-100m
距离测量精度	$\pm(2\text{mm}+d \times 1/10000)^*$		
连续测量功能	✓		
面积体积测量	✓		
勾股测量功能	✓		
加减测量功能	✓		
面积体积加减	✓		
最大/最小值	✓		
自助校准功能	✓		
声音提示	✓		
激光类型等级	2级 630-670nm, <1mW		
存储记录笔数	99笔		
自动切断激光	20秒(单次测量)		
自动关机	150秒		
最大电池寿命	8000次		
存储温度范围	-20°C~60°C		
工作温度范围	0°C~40°C		
存储湿度	20%~80% RH		
使用电池	2节1.5V AAA电池		
外形尺寸	108x50x25mm		

* “d” 表示实际距离

** 在恶劣的环境下，如阳光过于强烈、环境温度波动过大、反射面反射效果较弱、电池电量不足等情况，测量结果会有较大的误差，此种情况配合目标反射板测量效果更佳。

仪器日常保养

- 禁止将仪器长期放置在高温高湿的环境中储存，长期不使用仪器时，请取出电池并把仪器放置在随机的仪器套内放在阴凉干爽处存放。
- 请保持仪器表面清洁，可用湿的软布擦拭表面灰尘，不可用带有腐蚀性洗液清洁仪器。可按照擦拭光学器件表的方法擦拭激光器窗口和聚焦镜。

装箱清单

购买仪器时请按下列清单认真检查仪器所有附件是否完整？

项目	名称	单位	数量	备注
1	主机	台	1	
2	1.5V AAA电池	节	2	
3	说明书	本	1	
4	保修合格证	张	1	
5	彩盒	个	1	
6	挂绳	条	1	

检验员：

日期：



Safety Regulations

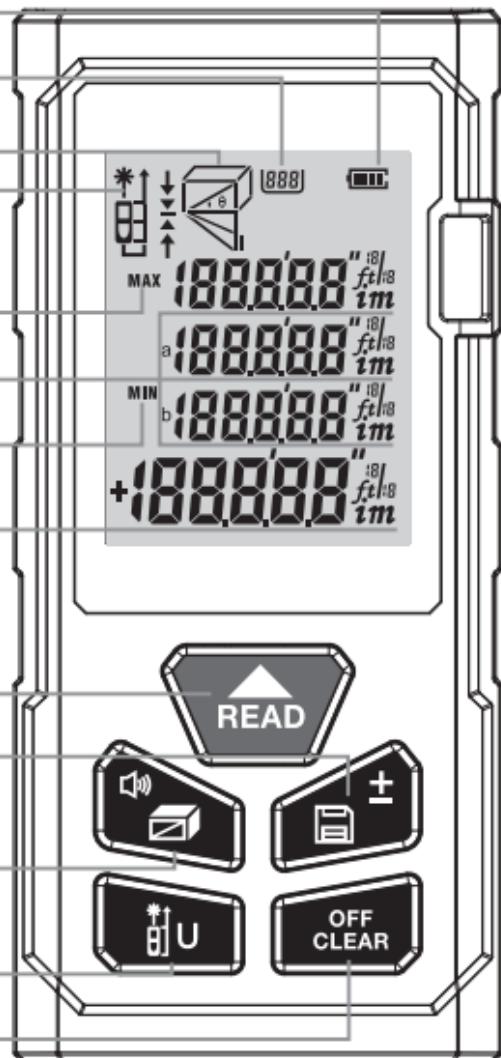
Please read the safety regulations and operation guide carefully before operating.

- ⚠ 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 cause 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 the 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 batteries or meter device should 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.

Display / Button

● Display

- Power Supply
- Record
- Length, Area, Volume and Pythagorean
- Laser on
- Maximum Value
- Auxiliary Display
- Minimum Value
- Major Display

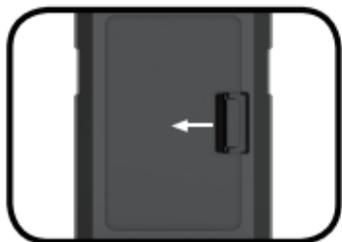


● Button

- Turn on/Measuring
- Addition & Subtraction/Save
- Sound/Area/Volume/ Pythagorean Mode
- Reference Point/ Unit Switch
- Turn off/Remove

Batteries Installation

● Battery Installation and Replacement



- Open the battery door on the back of device, and place batteries according to correct polarity, then close the battery door.
- 1.5 V AAA battery is applied to the meter.
- If not used for a long time, please take out the batteries to avoid battery corrosion to meter body.

Start the Instrument / Menu Setting

● Turn On/Off the Instrument

Under off state, press  , device and laser get started simultaneously and the device enters the measurement mode.

Under on state, long press  for 3 seconds to turn the device off. The device can also be shut off without any operation within 150 seconds.

● Unit Setting

Long press  , reset current measurement unit, the default unit is: 0.000m. There are 6 units for selection.

Measurement units:

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

● Changing Reference Point

Short press  to change the reference point.

The default reference point is the terminal baseline.

● Backlight on/off

The backlight is set to turn on and off automatically.

The backlight will be on for 15 seconds if any key is pressed. The backlight will automatically turn off if there is no operation within 15 seconds to save power.

● Keys Sound

Long press  to turn on or off the sound.

Self-calibration function is provided to ensure the precision of the device.

First, make sure the device is power off, long press  then press  to start the device. Next, loose  when "CAL" and a twinkling figure show at the display. Then the device enters self-calibration mode. At this time, the user can adjust the figure by  and  according to the error of the instrument.

The adjustment range is -9~9mm. Finally, long press  to save the setting.

For example, the actual distance is 3.780m.

If the measured value is 3.778m, 2mm smaller than the actual value, the calibration value can be adjusted up by 2mm on the existing basis with  through the calibration function.

If the measured value is 3.783m, 3mm larger than the actual value, the calibration value can be lowered by 3mm on the existing basis with  through the calibration function.

After the adjustment, press  to save the calibration result .

Single Measurement

Under the test mode, press  , and the instrument emits laser to lock the measuring point. Press  again for single distance measurement, and the measurement result will be displayed in the major display area.

Continuous Measurement

Under the test mode, long press  to enter the continuous measurement mode, and the maximum and minimum measured values measured in the continuous measurement process will display in the auxiliary display area.

The current measurement value will display in the main display area. Short press  or  to exit the continuous measurement mode.

Area Measurement

Press  ,  shows at the screen. One of the side of rectangle blinks at the display, please follow the below instructions for area measurement:

Press  once for length

Press  again for width

The device automatically calculates the area and shows the result in the major display area. The measuring results of the length and width of the rectangle will be showed in the auxiliary display area.

Press  , clear off the result and measure again if necessary.

Press  again to exit the mode.

Volume Measurement

Press  twice to enter volume measurement mode.

A  will show at the top of the screen. Please follow the below instruction for volume measurement:

Press  for length

Press  again for width

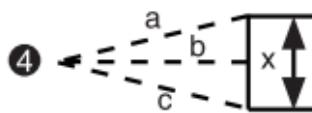
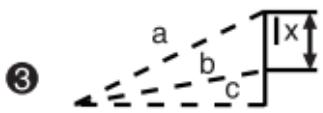
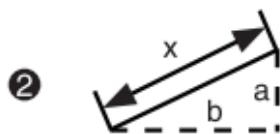
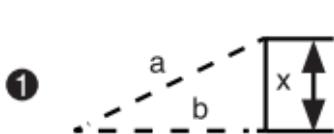
Press  thirdly for height

The device automatically calculates the volume and shows the result in the major display area. The measuring results of the length, width and height of the cube will be showed in the auxiliary display area.

Press  , clear off the result and measure again if necessary.

Press  again to exit the mode.

Pythagoras



There are four Pythagoras modes which is convenient for indirect measurement in a specific complex environment.

1. Calculate the second leg by measuring the hypotenuse and another leg.

Short press  three times to enter Pythagoras mode, the hypotenuse of  blinking.

Press  , measure the length of hypotenuse (a)

Press  , measure the length of one leg (b)

Device automatically calculates the length of another leg (x)

2. Calculate the hypotenuse by measuring the length of two legs.

Short press  four times, when one leg of  is blinking.

Press  , measure the length of one leg (a)

Press  , measure the length of another leg (b)

Device automatically calculates the length of hypotenuse (x)

3. Press  five times till the one side of , blinking on the screen.

Press   , measure the length of one side (a)

Press   , measure the length of the median line (b)

Press   , measure the length of another side (c)

Device calculates the length of the leg in full line (x)

4. Press  six times till the hypotenuse of  blinking on the screen.

Press   , measure the length of one hypotenuse (a)

Press   , measure the length of one leg (b)

Press   , measure the length of another hypotenuse(c)

Device calculates the length of the leg in full line (x)

Legs must be shorter than hypotenuse, or there will be "err" showed at screen. In order to guarantee the accuracy, please make sure all measurements are started from the same point and in the order of hypotenuse and legs.

Addition / Subtraction

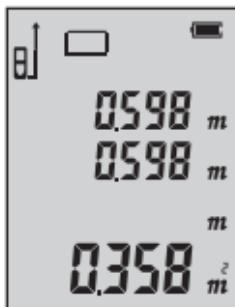
The device can be used for the addition and subtraction of single measurement distance. After obtaining the result of a single measurement, enter the selection of addition/ subtraction function through  .

Short press   , when "+" shows in the major display area, the device enters addition mode. The screen displays the sum of the last measured value and the current measured value.

Short press  , when "-" shows in the major display area, the device enters subtraction mode. The screen displays the difference between the last measured value and the current measured value.

Not only length can be calculated by addition and subtraction, but also area and volume. Take area as an example:

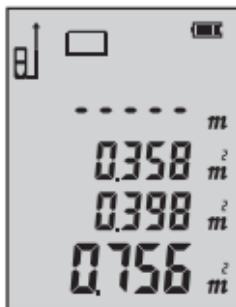
Measure the first area and the result is shown in PIC1. Then press  to measure the second area and the result is shown in PIC2, and "+" will appear in the lower left corner of the screen. Finally, press  to get the sum of two areas, as shown in PIC3.



PIC1



PIC2



PIC3

Record Function

In measurement mode, if the current data is valid, it will be automatically stored in memory, and the record number **1 88** at the top of the screen will continue to accumulate.

● Browse / Delete the Records

Long press  to browse the stored measurement data, use  to scroll backward for record, use  to scroll forward for record. While browsing records, long press  to clear all records. Short press  or  to exit the mode.

Tips

During use, the following prompts may be displayed in the major display area:

Prompt	Cause	Solution
Err	Out of the measurement range	Use the device within the measurement range.
Err1	Signal is too weak	Choose the surface with stronger reflection. Use the reflecting plate.
Err2	Signal is too strong	Choose the surface with weaker reflection.
Err3	Low battery voltage	Replace batteries.
Err4	Beyond working temperature	Use the device in the specified temperature.
Err5	Pythagoras measuring breaks the rules	Re-measure and ensure that hypotenuse is longer than legs.

Technology Specifications

ITEM	SW-MS50	SW-MS70	SW-MS100
Working Range	0.05-50m	0.05-70m	0.05-100m
Precision	$\pm(2\text{mm}+d*1/10000)*$		
Continuous Measurement	√		
Area/Volume Measurement	√		
Pythagorean Measurement	√		
Add and Subtract Measurement	√		
Area & Volume Addition/Subtraction	√		
Min/Max Value	√		
Self-Calibration	√		
Voice Prompt	√		
Laser Level			
Laser Type	630-670nm, <1mW		
Max Storage	99 units		
Automatically Cut off Laser	20s (single measurement)		
Auto Power-off	150s		
Battery Life	8000 times for single measurement		
Storage Temperature	-20°C~60°C		
Working Temperature	0°C~40°C		
Storage Humidity	20%~80% RH		
Battery	2x1.5V AAA		
Dimension	108x50x25mm		

* "d" indicates the actual distance.

** In harsh environments, such as strong sunlight, large fluctuations in ambient temperature, the reflecting surface with weak reflection effect, and low battery, there will be a large error in the measurement results. In this case, to enhance the measurement effect, please use the target reflector.

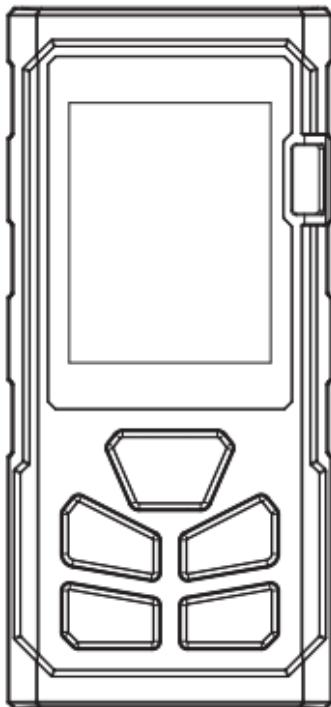
Instrument Maintenance

- The meter should not be stored in high temperature and humid environment for a long time. If it is not used very often, please take out the battery and place the meter in the portable bag and store it in cool and dry place.
- Please keep the device surface clean. Use a soft wet cloth to wipe the dust on the surface. Do not use corrosive liquid to clean the device. Use the same method as wiping optical devices to wipe the meter and focusing mirror.

Packing List

Please check if all accessories are complete according to the following list.

No.	Item	Unit	QTY	Note
1	Meter	pc	1	
2	User Manual	pc	1	
3	Gift Box	pc	1	
4	Hand Strap	pc	1	



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