SNDWAY

深达威® 手持式激光测距仪

Laser Distance Meter

用户手册
User Manual

SW-80GQ SW-120GQ SW-150GQ SW-200GQ


产品执行标准： GB/T 14267-2009



2024L379-44

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 SNDWAY 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

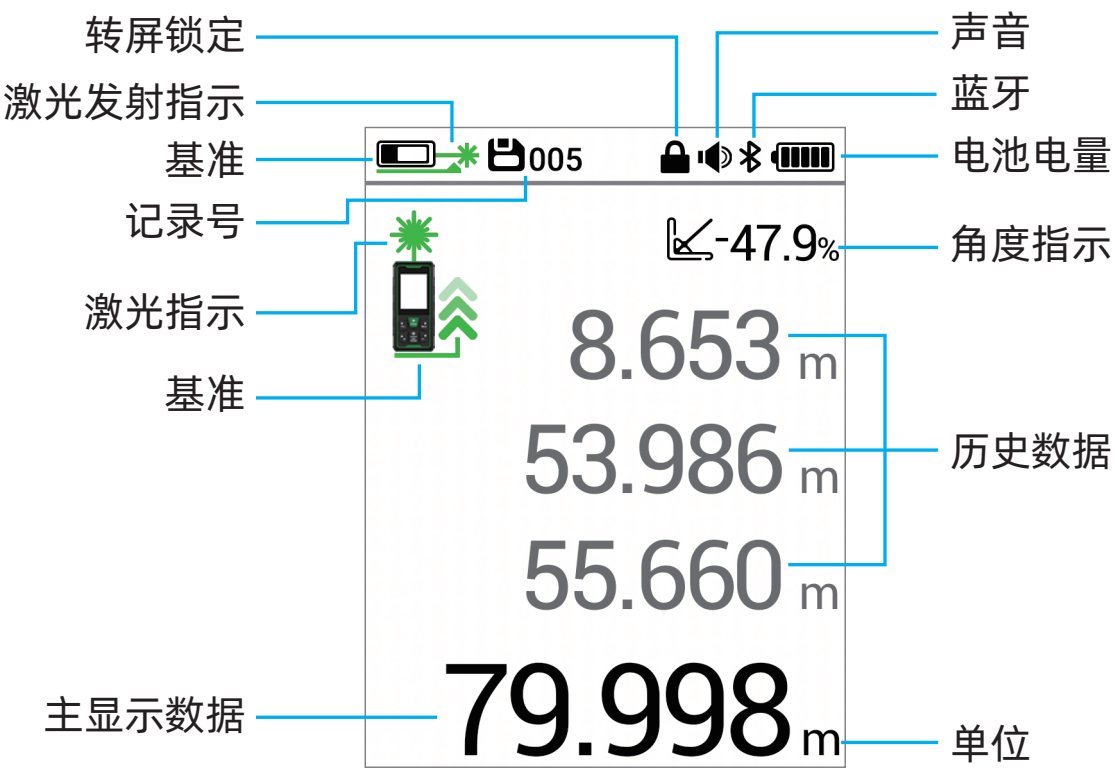


图1 主界面

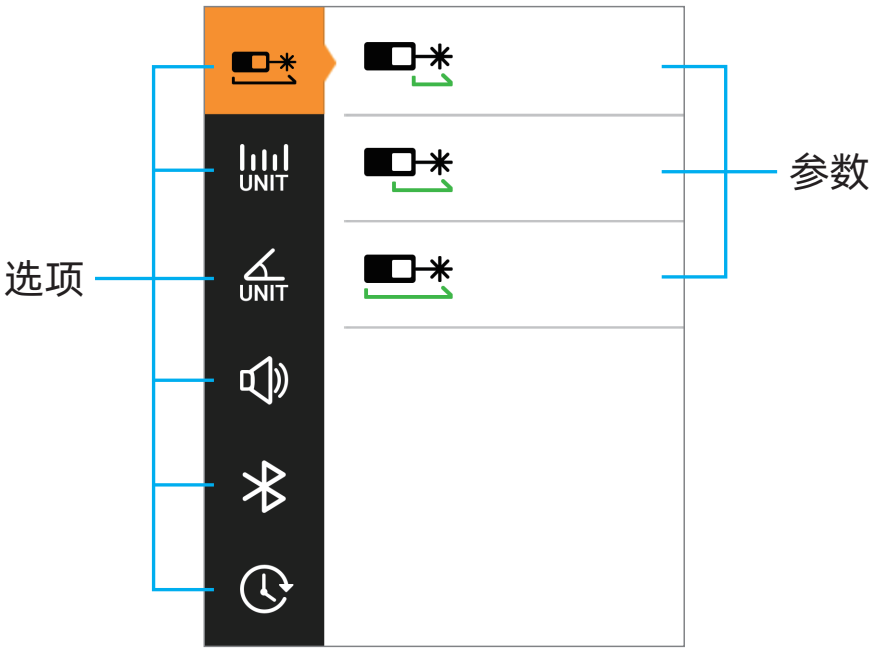


图2 菜单界面

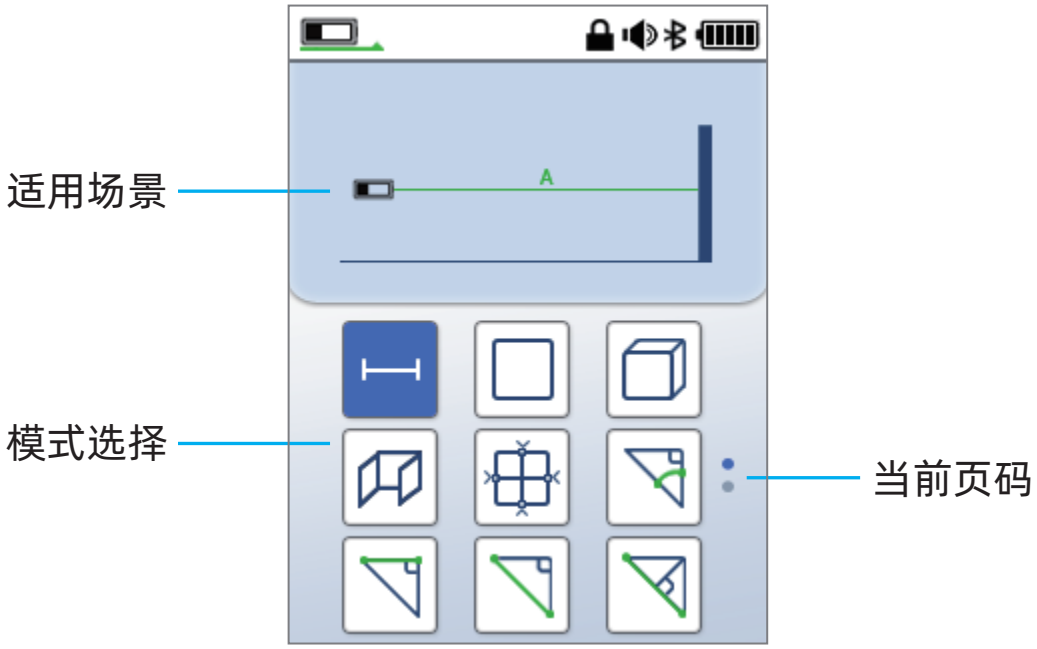
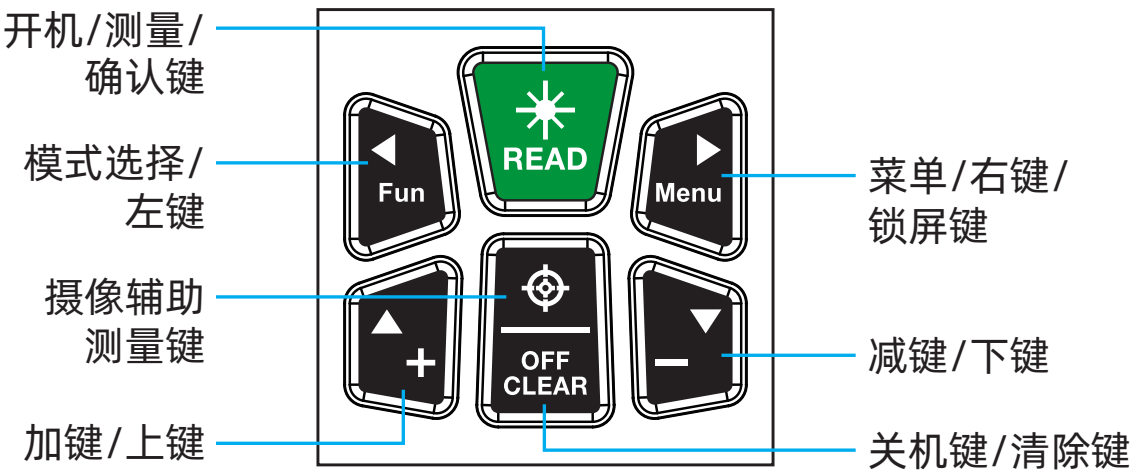
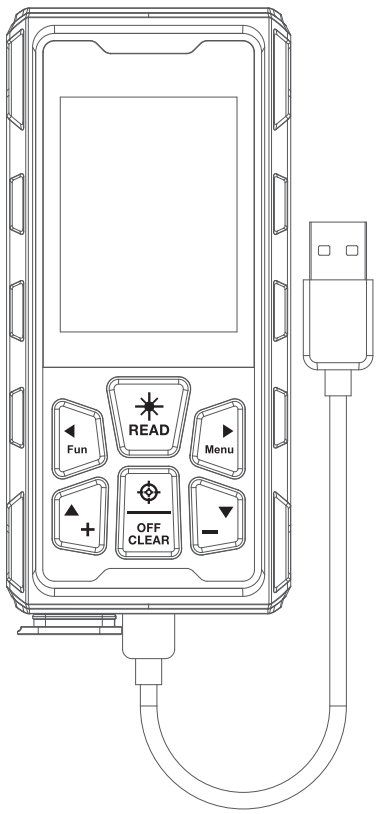

适用场景
模式选择
当前页码
A

图3 模式选择界面

按键


开机/测量/
确认键
模式选择/
左键
摄像辅助
测量键
加键/上键
READ
Fun
Menu
OFF
CLEAR
菜单/右键/
锁屏键
减键/下键
关机键/清除键

锂电池充电



Type-C 直充

锂电池

仪器内置 3.7V 2000mAh 电池，不可拆装。仪器自带充电电路，具有明晰的欠压指示、充电指示。

电池用过一段时间后容量不足时，开不了机或开机后，电池符号空白闪烁显示，需要及时充电。插入USB充电，电池符号滚动显示 ，充满电后停止滚动并显示 。

电池保养

长时间不使用时，先把产品充满电，并每半年再充电一次，以免电池放电损坏。

启动仪器

关机状态下，长按 READ 键 ，仪器进入待测模式。

开机状态下，长按 OFF CLEAR 键关闭仪器，或者在300秒内未对仪器进行任何操作仪器将自动关闭。(300秒是默认值，用户可以根据需要自己设定，参考菜单设置)。

单次测量

操作步骤如下:

1. 待测模式下，短按 READ 键，仪器激光发射。
2. 锁定测量目标，短按 READ 键，仪器测得一次距离，并显示在屏幕的主显示区。 在辅助显示区，会显示最近三次测得的历史数据，可短按 OFF CLEAR 键清除。

连续测量

此模式方便用户找到某一距离点，而勿需频繁的按键，即可得到需要的数据。操作步骤如下:

1. 待测模式下，长按 READ 键，仪器进入连续测量模式，屏幕会显示最大值MAX和最小值MIN，以及最大最小的差值 Δ，主显示区会显示当前测量值。
2. 短按 READ 键或者 OFF CLEAR 键，退出连续测量。

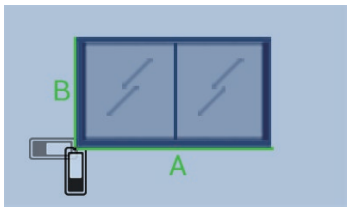
测量完毕后，测量结果自动保存到存储介质中，以方便随时查阅。

模式选择

短按 Fun 键，进入模式选择界面。操作如下：

- 短按 + − Fun Menu 键切换模式；
- 短按 READ 键进入选择的模式；
- 短按 OFF CLEAR 键返回测量界面。

面积测量



（适用场景）

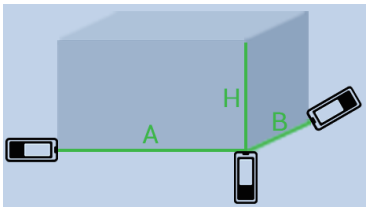
选择 □ 模式，屏幕显示 ▭，根据提示完成下列操作。

□ 按 READ 键，测得长方形的长；

□ 按 READ 键，测得长方形的宽；

测量完成后，仪器自动计算出面积。如果用户认为本次测量数据可能有误，还可短按 OFF CLEAR 键，返回上一次的测量，进行重新测量。

体积测量



（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

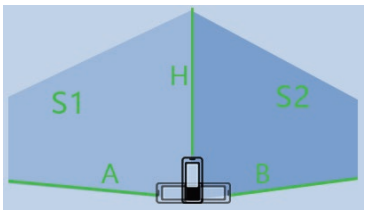
按 READ 键，测得立方体的一条边(长);

按 READ 键，测得立方体的一条边(宽);

按 READ 键，测得立方体的一条边(高);

用户在实际测量时，并不一定要按照长宽高的顺序进行测量。在第三次测量完成后，仪器自动计算出体积，如果用户认为本次测量数据可能有误，还可短按 OFF CLEAR 键，返回上一次的测量，进行重新测量。

墙面面积测量



（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得墙面的高度;

按 READ 键，测得墙面S1的宽度1;

仪器会自动计算墙面的面积=高度x宽度1;

按 READ 键，测得墙面S2的宽度2

仪器会自动计算墙面的面积总和

面积总和= 高度 x（ 宽度1+宽度2）；依次类推，按 READ 键，测得墙面n的宽度n；面积总和=高度 x（ 宽度1+宽度2+.....+宽度n）；

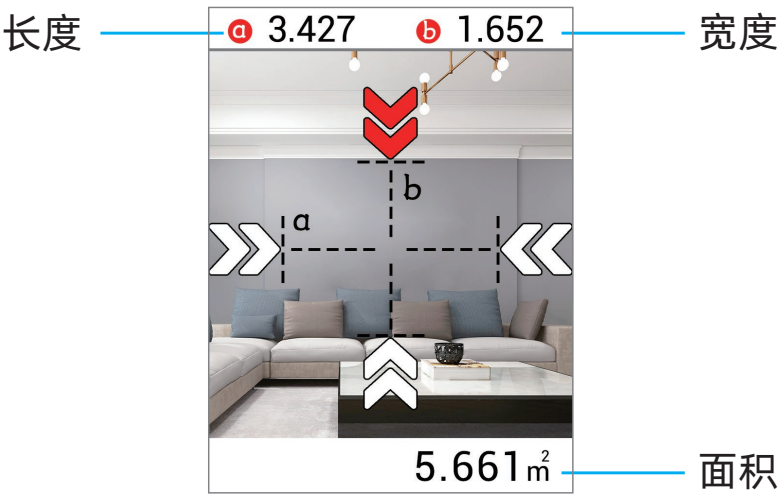
如果用户认为本次测量数据可能有误，还可短按 OFF CLEAR 键，返回上一次的测量，进行重新测量。

摄像面积测量

（适用场景）

选择 模式，功能简介：用户测量到目标距离，再通过摄像画面调整长(a)宽(b)至目标的长宽边界重合,仪器自动计算出目标的面积，操作如下：

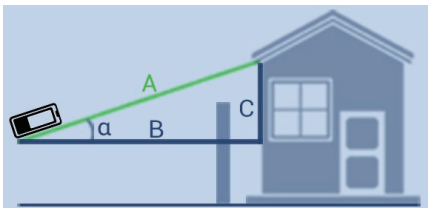
1. 对准测量目标，让目标整体呈现在摄像画面内；
2. 短按 READ 键，摄像画面定格；画面中显示四个箭头，通过 + / − 键调整箭头位置和目标边界重合；
3. 短按 Menu 键切换箭头，继续调整箭头位置和目标边界重合；
4. 所有箭头都和目标边界重合以后，目标面积自动计算并显示在下方；
5. 短按 READ 键或 OFF CLEAR 键开启第二次测量。



三角形勾股定理间接测量

注意：在三角形测量过程中，仪器若出现了“ERR 5”的字样，表明测量数据不满足三角形规则，如直角三角形斜边小于直角边等状况，仪器会提示“ERR 5”错误信息，并要求用户重新测量。

1. 求直角三角形的高度及水平距离（测角测高）



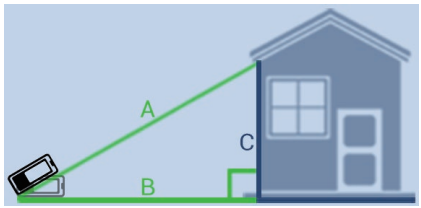
（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得直角三角形的斜边及倾角；

在测得直角三角形斜边后，仪器将根据斜边长度及倾角计算直角三角形的高度C及水平距离B。

2. 求直角三角形高



（适用场景）

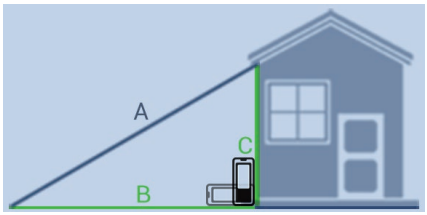
选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得直角三角形的斜边A;

按 READ 键，测得直角三角形的直角边B;

仪器会在第二次测量结束后，自动计算三角形的高C;

3. 求直角三角形斜边



（适用场景）

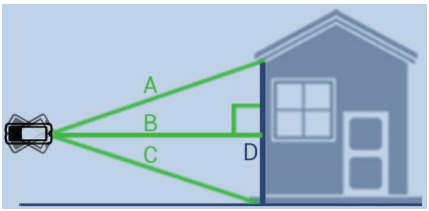
选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得直角三角形的一直角边B;

按 READ 键，测得直角三角形的另一直角边C;

仪器会在测量结束后，自动计算三角形的斜边A;

4. 求三角形底边和



（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

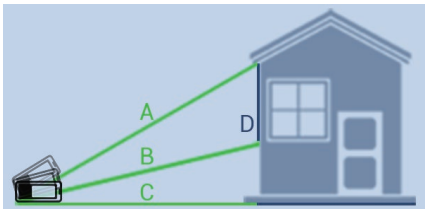
按 READ 键，测得三角形的一边C;

按 READ 键，测得三角形的高B;

按 READ 键，测得三角形的另一边A;

仪器会在测量结束后，自动计算三角形的第三条边D。

5. 三角形辅助线高度测量



（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

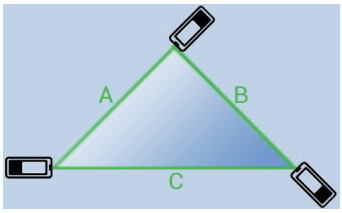
按 READ 键，测得三角形的一边A；

按 READ 键，测得三角形的辅助线长度B；

按 READ 键，测得三角形的底C；

仪器会在测量结束后，自动计算三角形的辅助线高度D。

三角形面积测量



（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

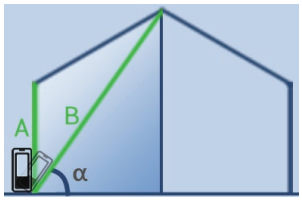
按 READ 键，测得三角形的第一条边A；

按 READ 键，测得三角形的第二条边B；

按 READ 键，测得三角形的第三条边C；

仪器会在测量结束后，自动计算三角形的面积S。

梯形面积测量



（适用场景）

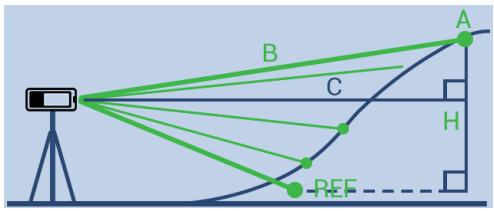
选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得矩形的第一条边A；

按 READ 键，测得矩形的第二条边B以及倾角α；

仪器会在测量结束后，自动计算梯形的面积。

断面测量



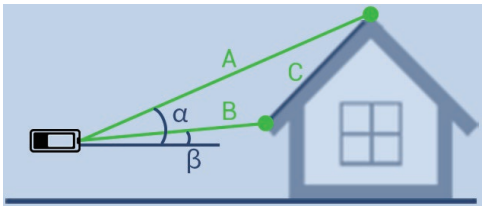
（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得仪器到参考点REF的距离；

按 READ 键，仪器开启自动测量，屏幕实时显示：仪器到目标点的距离 、仪器到目标点的水平差 同时目标点和参考点的高度差显示在下方主显示区。

坡面测量



（适用场景）

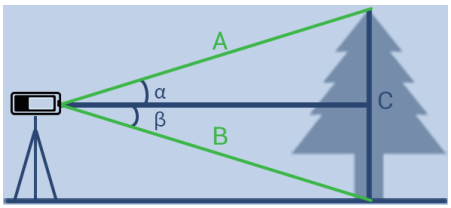
选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测得的第一条边A；

按 READ 键，测得的第二条边B；

仪器会在测量结束后，自动计算坡度C的高度 ，和坡度C的长度 。

高度跟踪



（适用场景）

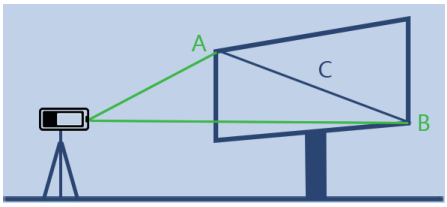
选择 模式，屏幕显示 ，根据提示完成下列操作。

按 READ 键，测量一条边B，屏幕显示B的角度 和B的长度 ，

再短按 READ 键，测量另一条边A, 仪器开启连续测量，

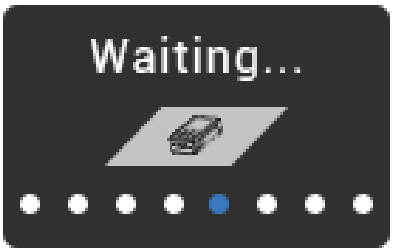
屏幕实时显示：A的角度 和A-B之间绝对高度差 。

空间任意两点间距离测量(方位角测量)



（适用场景）

选择 模式，仪器进入校准状态，屏幕显示：



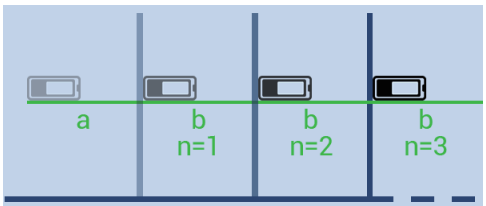
请将仪器静止放置，等待约3s时间即可完成校准，(若期间有震动，将导致仪器无法校准完成)，用户可短按 OFF CLEAR 键退出校准。建议用户开启测量前，进行一次校准，以提升数据准确性。校准完成后，根据提示完成下列操作：

按 READ 键，测量仪器到A点的距离；

按 READ 键，测量仪器到B点的距离；

仪器自动计算出A-B之间的距离C。

放样测量



（适用场景）

选择 模式，屏幕显示 ，根据提示完成下列操作。

1. 进入放样后，通过 [+] [−] 键调整a的大小(长按 [+] [−] 键可增加调整幅度)。 调整完成后短按 [READ] 键，放样a值被设定。
2. a设定后，通过 [+] [−] 键调整b的大小(长按 [+] [−] 键可增加调整幅度)。调整完成后短按 [READ] 键，放样b值被设定，仪器开始放样。

放样标志:

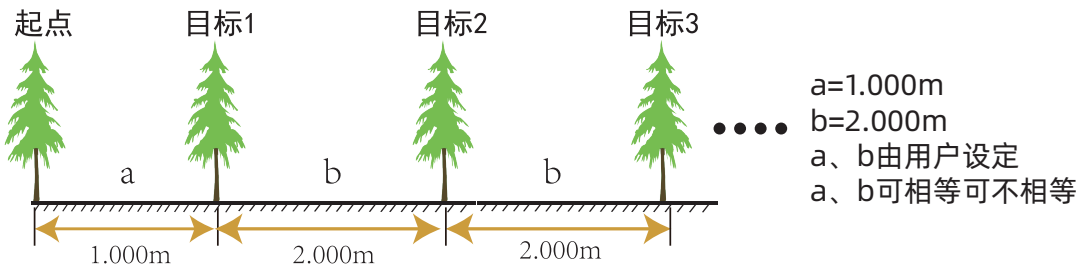
：仪器未到放样点，请往后移动仪器;

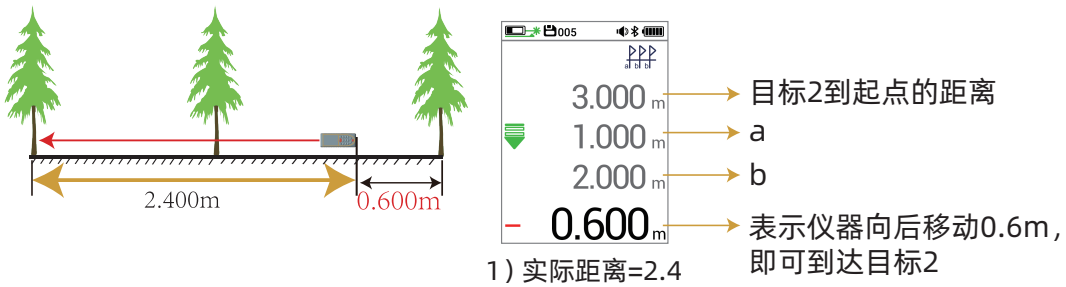
：仪器超过放样点，请往前移动仪器;

：仪器到达放样点;

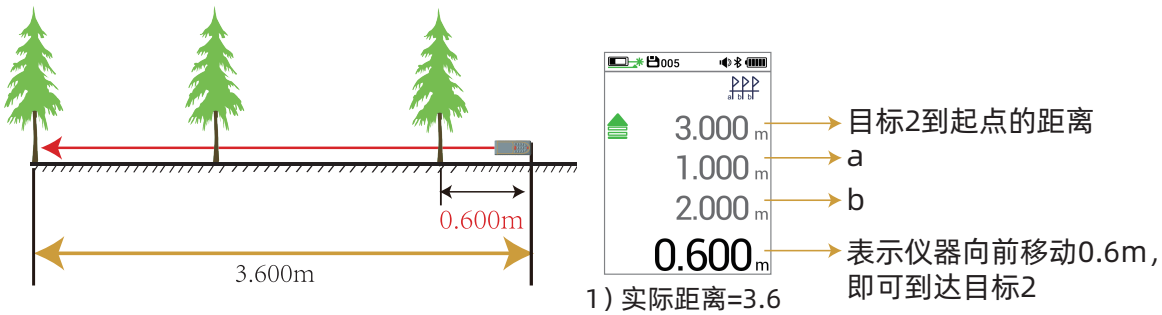
退出放样：短按 [OFF CLEAR] 键退出放样。

功能说明:





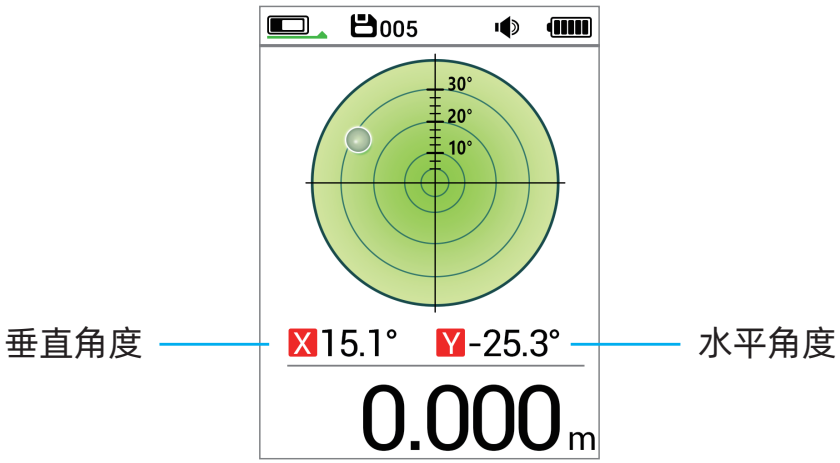
1）实际距离=2.4



1）实际距离=3.6

水平泡测量

选择 模式，屏幕显示 ，根据提示完成下列操作。
万向电子水平泡模拟实际水平泡功能，测量相对于水平位置和垂直位置的倾斜角。



测量距离的累加

选择 模式，根据提示完成操作：

步骤1：按下 READ 键，激光打开，再按下 READ 键，主显示区将显示测量得到的数据；

步骤2：按下 键，仪器进入累加测量，屏幕下端左侧显示【+】；

步骤3：重复步骤1，测量第二次数据后，仪器将自动进行求和，辅助显示区显示第一次和第二次的测量数据，主显示区显示两次数据的和；

步骤4：重复步骤1，每次测量数据后，仪器会继续求和，辅助显示区显示上次求和的数据与最后测量数据，主显示区显示两数据的和，依此类推。

测量距离的累减

选择 模式，根据提示完成操作：

步骤1：按下 READ 键，激光打开，再按下 READ 键，主显示区将显示测量得到的数据；

步骤2：按下 键，仪器进入累减测量，屏幕下端左侧显示【-】；

步骤3：重复步骤1，测量第二次数据后，仪器将自动进行求差，辅助显示区显示第一次和第二次的测量数据，主显示区显示两次数据的差；

步骤4：重复步骤1，每次测量数据后，仪器会继续求差，辅助显示区显示上次求差的数据与最后测量数据，主显示区显示两数据的差，依此类推。

注：在累加累减过程中，可短按 OFF CLEAR 键取消最后一次的累加累减值。短按 OFF CLEAR 多次，退出累加累减状态。

测量面积的累加和累减

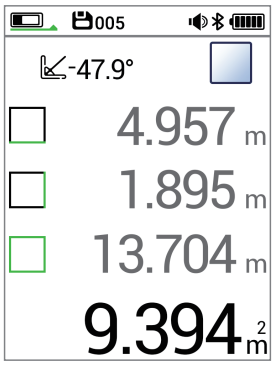


图4 第一次测量面积

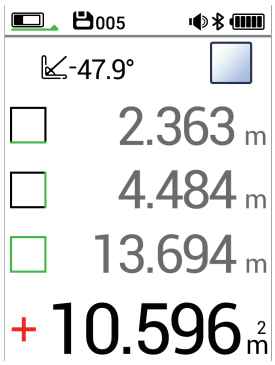


图5 第二次测量面积

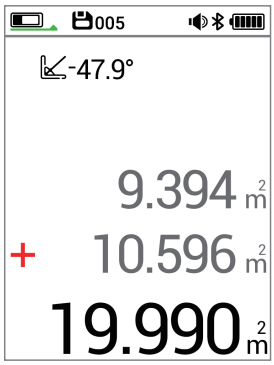


图6 面积求和结果

步骤1：测量一次面积（参照 面积测量），如图4所示；

步骤2：短按 键，屏幕将清除数据，主显示区显示【+】；

步骤3：重复步骤1，测量第二次面积，结果如图5所示；

步骤4： 短按 READ 键，仪器会自动将两次面积求和。辅助显示区会显示第一次和第二次面积值，主显示区是两次面积的和，如图6所示。

多次累加：在步骤3结束之后，重新执行步骤2和步骤3可继续累加下一个面积，最后执行步骤4，将多个面积求和。

注： 累减的操作步骤和累加类似，不再做说明。

测量体积的累加和累减

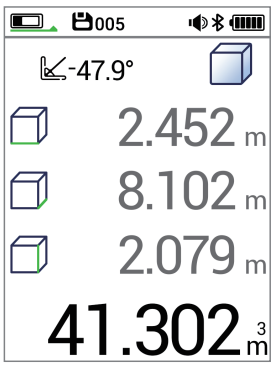


图7 第一次测量体积

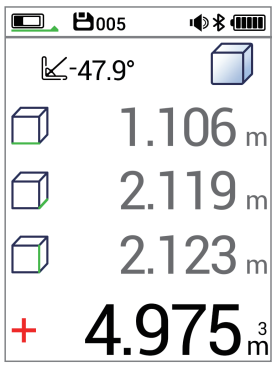


图8 第二次测量体积

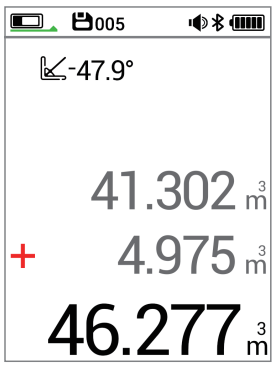


图9 体积求和结果

步骤1：测量一次体积（参照 体积测量），如图7所示；

步骤2：短按 键，屏幕将清除数据，主显示区显示【+】；

步骤3：重复步骤1，测量第二次体积，结果如图8所示；

步骤4：短按 READ 键，仪器会自动将两次体积求和。辅助显示区会显示第一次和第二次体积值，主显示区是两次体积的和，如图9所示。

多次累加：在步骤3结束之后，重新执行步骤2和步骤3可继续累加下一个体积，最后执行步骤4，将多个体积求和。

注： 累减的操作步骤和累加类似，不再做说明。

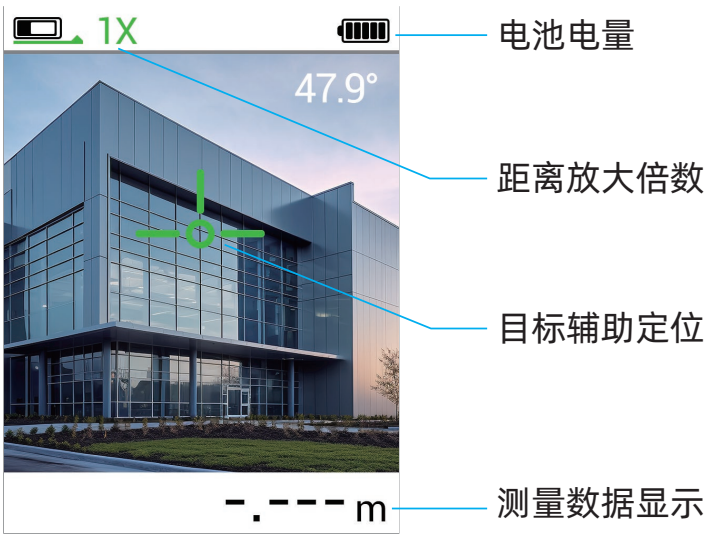
保存记录

仪器测量完毕后，测量结果自动保存到存储介质中，最大存储笔数100笔，记录查看请参考菜单设置。

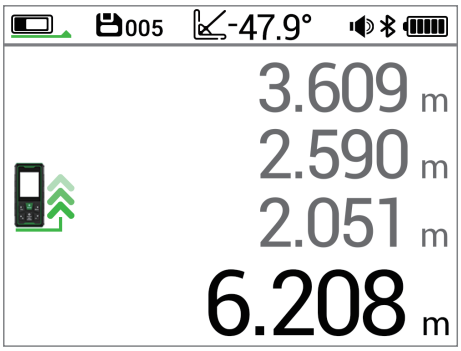
辅助摄像测量

在强烈日光下，激光无法用肉眼识别。用户可以通过辅助测量功能来测量距离，操作方法如下:

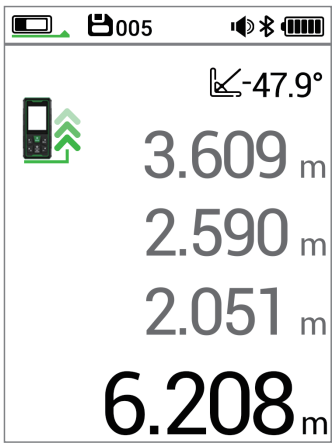
1. 进入辅助测量：在待测模式下短按 键;
2. 测量距离：将屏幕中心圆圈对准测量目标，进行单次测量，测量结果显示在屏幕下方;
3. 缩放：短按 Fun 键循环切换1X/2X/4X，3种缩放模式;
4. 退出辅助测量：短按一次 键，或者短按 OFF CLEAR 键退出，若有测量数据，短按多次 OFF CLEAR 键至数据清零后退出;
5. 短按 键，测量的数据将会显示在屏幕上。



自动转屏与锁定



（横向显示）



（纵向显示）

- 自动转屏： 仪器可自动根据当前方向，旋转显示内容，支持360°旋转，4个方向显示。
- 锁定屏幕：长按 Menu 键可以锁定/解锁当前屏幕方向，锁定时，屏幕显示 图标。

注： 电子水平泡模式、方位角模式和摄像模式不支持转屏。

菜单设置

- **菜单操作：**

1. 短按 Menu 键，进入菜单选择；
2. 短按 + − 键，选择选项；
3. 短按 READ 键，进入选项设置；
4. 短按 OFF CLEAR 键，返回测量界面；

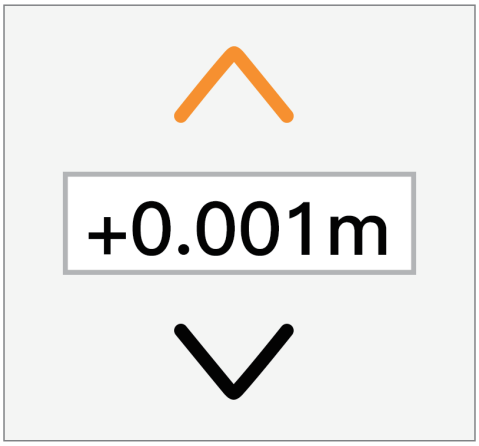
- **选项设置操作：**

1. 短按 + − 键，选择不同设置参数；
2. 短按 READ 键，确认当前参数；
3. 短按 OFF CLEAR 键，返回菜单选择；

- 菜单选项：

序号	选项	参数
1.基准		: 前基准 : 中基准 : 后基准
2.长度单位	UNIT	0.000m、0.00m、0.00ft、0.0in、1/32in、0’00”
3.角度单位	UNIT	° : 角度单位 % : 坡度单位
4.声音		ON : 声音开 OFF : 声音关
5.蓝牙		ON : 蓝牙开 OFF : 蓝牙关
6.延时		2s、5s、10s、30s、OFF(关闭延迟)
7.背光时间		10s、30s、60s、ON(背光不关)
8.激光时间	OFF	20s、60s、120s
9.关机时间		2min: 2分钟自动关机 5min: 5分钟自动关机 ON: 不自动关机

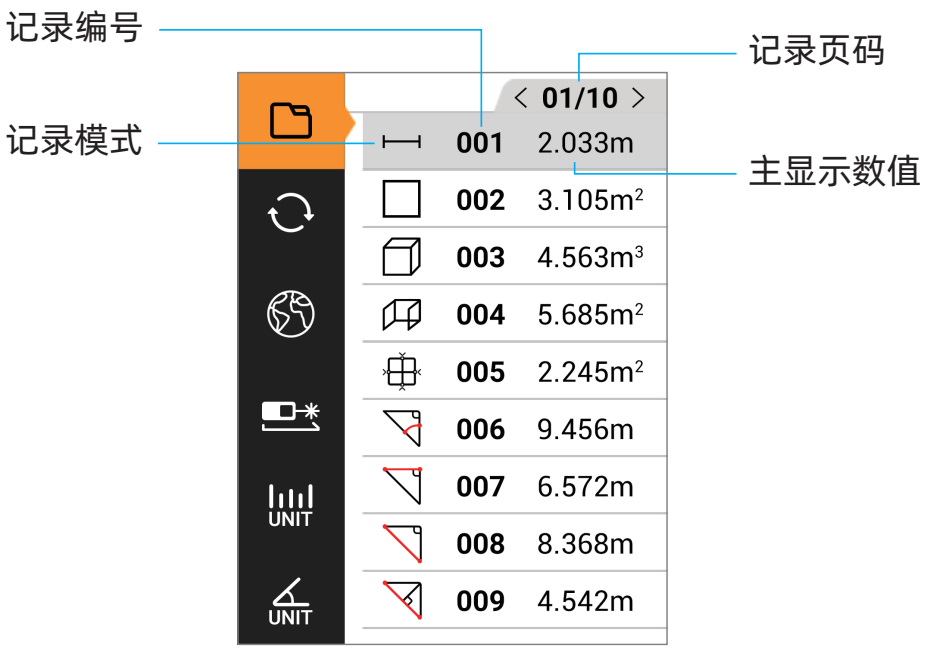
10. 自助校准



自助校准功能主要用于修正数据，当用户测量距离发生偏差时，可用该功能修正距离，修正范围：-0.009~0.009m。
比如用户认为偏大2mm，可将此值调整值-0.002m，即可补偿2mm；反之偏小2mm，则调整至0.002m。操作如下：

按照菜单操作，进入自助校准后，通过短按 [+] [−] 键修改自助校准数值，短按 [READ] 键保存修改值并返回菜单选择。

11. 查看记录



操作如下：

短按 [+] [−] 键，选择记录；

短按 [Fun] [Menu] 键，前后翻页；

短按 [READ] 键，查看记录详情；

短按 [OFF CLEAR] 键，返回菜单选择；

长按 [OFF CLEAR] 键，进入删除状态；

删除状态显示如下：

三个选项：
1）删除单条记录
2）删除全部记录
3）返回查看记录

操作如下：
短按 ▲+ ▼− 键，选择操作；
短按 READ 键，执行操作；
短按 OFF CLEAR 键，返回菜单选择；

12. 恢复默认设置

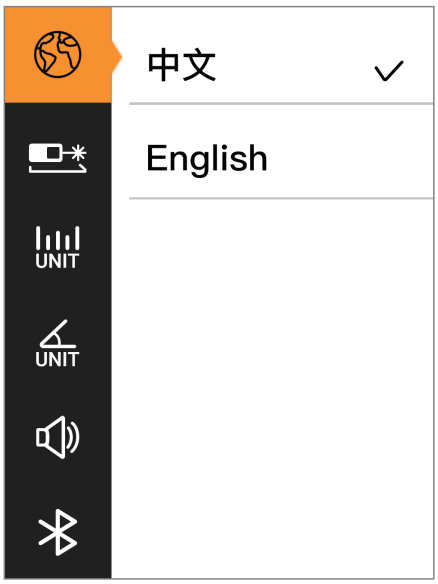
操作如下：

短按 ▲+ ▼− 键，选择操作；

短按 READ 键，执行操作，如果选择“是”，则仪器会恢复默认设置，选择“否”则返回；

短按 OFF CLEAR 键，返回菜单选择；

13. 语言设置



操作如下：

短按 ▲+ ▼− 键，选择操作；

短按 READ 键，执行操作，选择语言；

短按 OFF CLEAR 键，返回菜单选择；

USB联机功能

- 仪器提供USB电脑联机功能，官网软件包中提供WINDOWS软件LDM Studio，该软件方便电脑控制仪器的测量功能，可下载仪器的存储记录，支持打印及导出到EXCEL数据表格。
  软件下载官网地址：www.sndway.com
- 该仪器提供开放的 USB HID 通讯功能，供用户对仪器进行二次开发使用。完整协议请参看软件包内文档：
  USBHID命令列表.docx

安装及使用步骤：

1) 软件是免安装版，打开软件包中的LDMStudio文件夹，双击运行LDMStudio.exe文件，运行软件；

2) 软件运行后，用USB线连接仪器与电脑，若连接成功，界面左下端会出现“连接OK”字样；

3) 点击 

或 

按钮可控制仪器测量数据或清除数据；

4) 若仪器中保存有存储记录，可点击 

，导出仪器中的记录，导出记录后，可点击 

按钮，生成EXCEL文档，也可点击 

打印报表。

量房到初步方案设计助手APP

APP下载：

1） Android 应用市场搜索【知户型】下载；
IOS APP Store 搜索【知户型】下载；

2) 扫描二维码下载

激光测距仪通过APP方便实现：

3） 智能终端测距仪轻松互联，实时测量及数据共享，无需协助一个人就能轻松量房；

4） 移动端协同设计，快速现场出图，导出CAD/3Dmax等专业文件，无缝协同主流设计软件；

5） 专属权限激活路径：
测距仪保持开机 → 打开知户型APP → 左上角进入个人中心 → 激活码 → 硬件（立即激活）→ 连接测距仪，激活专属权限。

错误信息

在仪器出现ERR x 信息时，表示仪器可能无法进行正确测量，下面提出了可能会遇到的错误提示及解决办法。

错误信息	含义及解决办法
ERR 1	反射信号太弱，增加反光板
ERR 2	反射信号太强，测试不同的反射面
ERR 3	电池电压太低，对电池进行充电
ERR 4	存储器错误返厂进行维修
ERR 5	勾股定理错误重新测量
ERR 6	超出测量范围
ERR 7	摄像头错误，需返厂维修
ERR 8	角度传感器错误返厂进行维修

技术参数

项目	SW-80GQ	SW-120GQ	SW-150GQ	SW-200GQ
测量范围	80m	120m	150m	200m
测量精度	±(2mm+d *1/10000)*			
显示屏幕	2.4英寸 IPS彩屏			
激光类型等级	500-800nm <1mW； 2级;			
蓝牙通讯功能	√			
面积/体积测量	√			
墙面面积测量	√			
勾股测量	√			
测角测高功能	√			
加减测量功能	√			
面积体积加减	√			
最大/最小测量	√			
延时测量功能	√			
精度自助校准	√			
摄像面积测量	√			
梯形测量	√			
参考高度测量	√			
屋顶坡度测量	√			
高度跟踪测量	√			
方位角测量	√			
放样测量	√			
电子水平泡	√			
自动转屏	√			
角度测量范围	±90°			
角度精度	±1°			
机背铜螺母	1/4” 铜螺母			
防护等级	IP68			
自动关闭激光	20s(可设置)			
自动关机	300s(可设置)			
存储记录笔数	100笔			

电池类型	3.7V 2000mAh锂电池 Li-ion
充电规格	DC5V 1A Type-C
USB充电时长	约3小时
满电测量次数	不开摄像，单次测量5500次； 开摄像，单次测量3500次
存储温度	-20℃~60℃
工作温度	0℃~40℃
存储湿度	20%~80%RH
机身尺寸	128x60x29.5mm

* “d” 表示实际距离

** 在恶劣环境下如：阳光过于强烈，环境温度波动过大，反射面反射效果较弱，电池电量不足的情况下测量结果会有较大的误差，此种情况配合目标反射板使用效果更佳。

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面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	仪器便携包	个	1	
3	挂绳	条	1	
4	反光板	块	1	
5	说明书	本	1	
6	保修合格证	张	1	
7	彩盒	个	1	
8	USB Type-C线	条	1	

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 laser emitter. Please keep it out of reach of children and avoid being used by any irrelevant person.

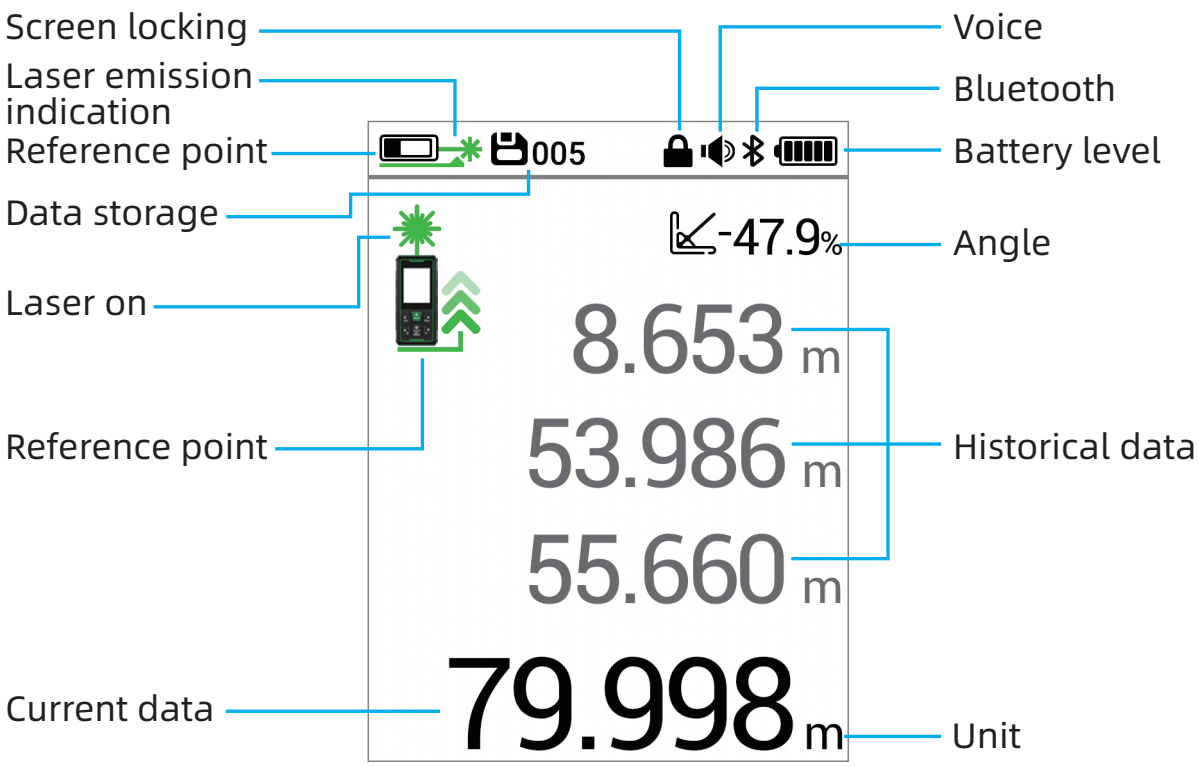
⚠ It is strictly prohibited to shoot eyes or other parts of body with the laser. It is not allowed to take the laser to shoot the surface of any highly reflective objects.

⚠ 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.

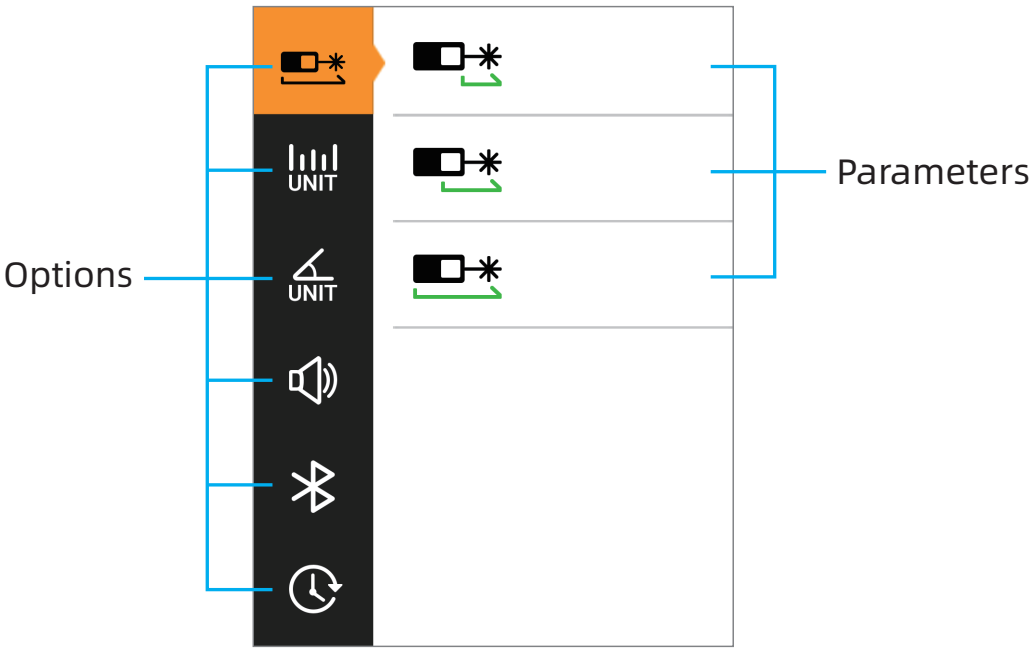
⚠ Discarded meter device should not be processed just like household garbage, please handle it in line with related law and regulations.

⚠ 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.

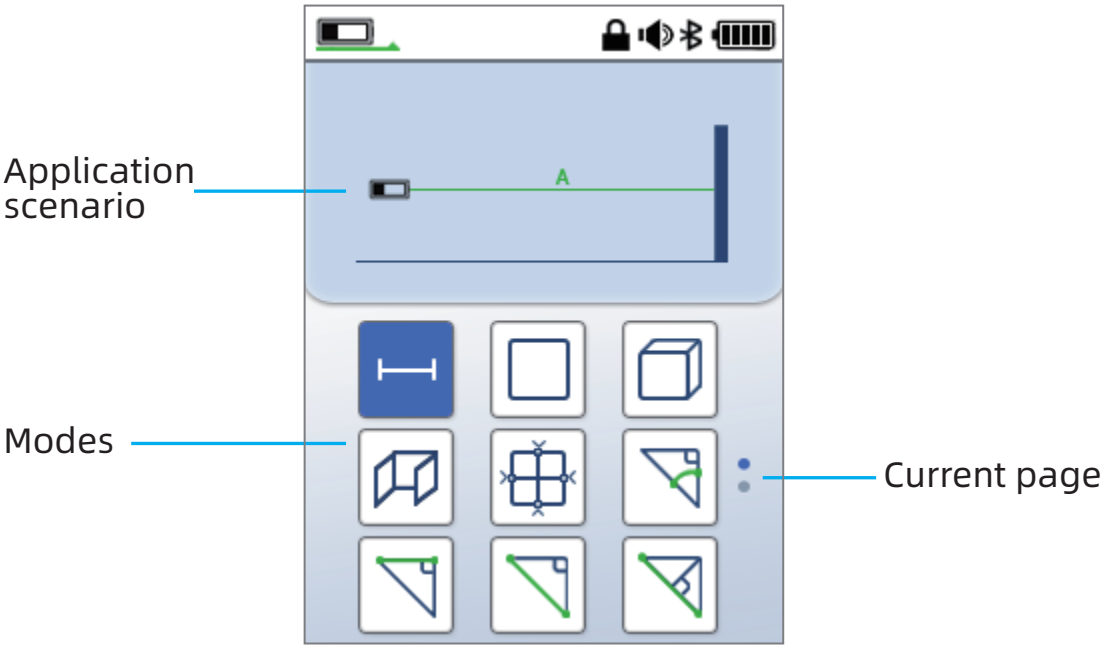
LCD



PIC1 Main interface

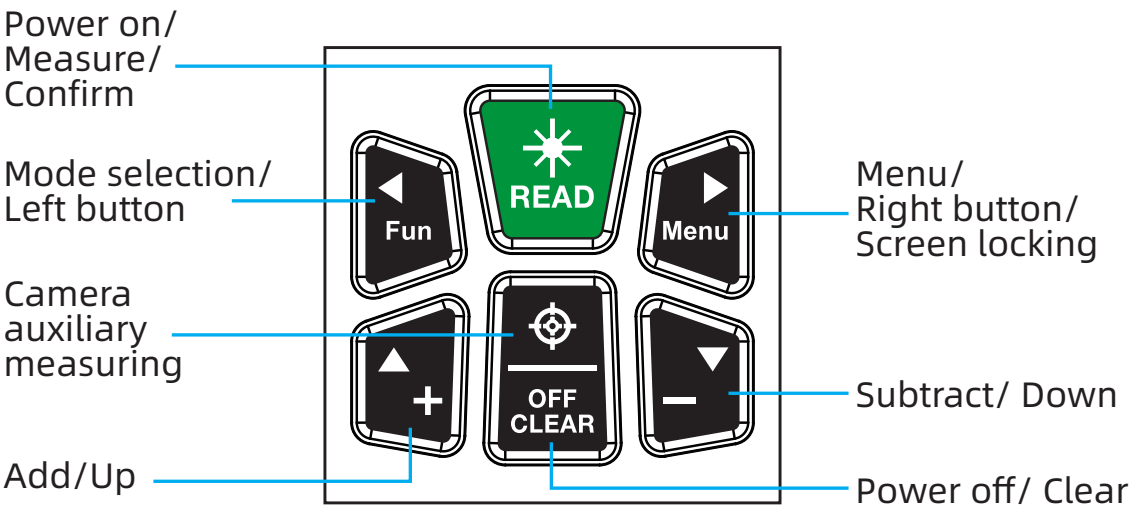


PIC2 Menu interface

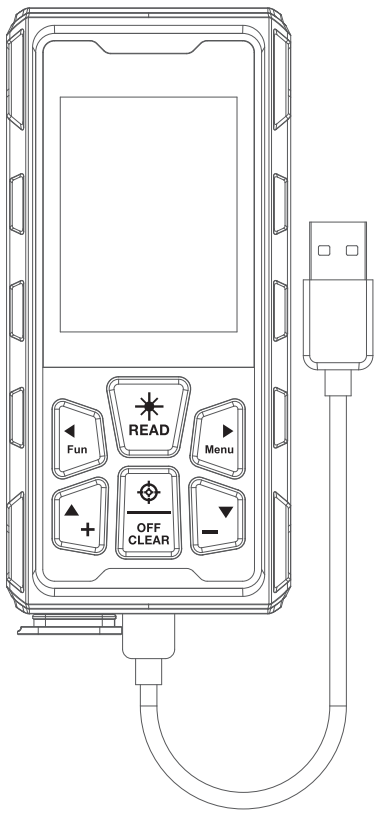


PIC3 Mode selection interface

Buttons



Li-ion Charging



Type-C charging

Lithium Battery

The built-in 3.7V 2000mAh battery is not removable. The instrument has its own charging circuit, with clear undervoltage and charging indication.

When the battery is low, the battery symbol is blank and flashes. In this case, charge the battery in time. Plug in the USB cable to charge, a scrolling battery symbol will appear on the screen, and the battery symbol will stop rolling when the battery is fully charged.

Battery Maintenance

When not used for a long time, please fully charge the product and recharge it every six months to avoid battery discharge damage.

Power on

In the shutdown state, long press READ key to enter the measuring mode.

In on state, long press OFF CLEAR key to turn off the instrument. If no operation is performed within 300 seconds, the instrument will automatically shut down. (300 seconds is the default value, users can to set it referring to the Menu Settings).

Single Measurement

The operation is as follows:

1. In the measurement mode, press READ key to emit laser.
2. Lock the measurement target, press READ key to measure the distance, and the value will be displayed in the main display area of the screen. The historical data of the last three measurements will be displayed in the auxiliary display area, which can be cleared by pressing OFF CLEAR key.

Continuous Measurement

This mode helps users to find a certain distance point without frequently pressing the button to get the required data. The operation is as follows:

1. In measurement mode, long press READ key to enter the continuous measurement mode. The screen will display the maximum value MAX and minimum value MIN, as well as the difference between the maximum and minimum values. The main display area displays the current measured value.

2. Short press READ or OFF CLEAR key to exit the continuous measurement. After completing the measurement, the measurement results are automatically saved to the storage media for easy access at any time.

Mode Selection

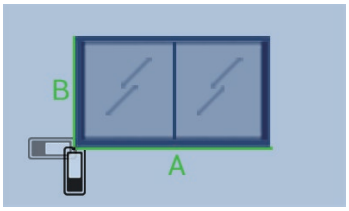
Press Fun key to enter the mode selection page. The operation is as follows:

Press + − Fun Menu to switch modes;

Press READ to enter the selected mode;

Press OFF CLEAR to return to the measurement interface;

Area Measurement



(Application scenario)

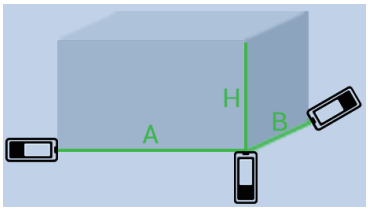
Select ▢ mode, the screen displays ▢ , follow the prompts to complete the following operations.

▢ Press READ key to measure the length of the rectangle;

▢ Press READ key to measure the width of the rectangle;

After the measurement is completed, the instrument automatically calculates the area. If the user thinks that the measurement data may be wrong, he can also short press OFF CLEAR key to return to the last measurement and re-measure.

Volume Measurement



(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

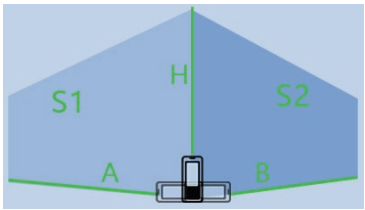
Press READ key to measure one side (length) of the cube;

Press READ key to measure one side (width) of the cube;

Press READ key to measure one side of the cube (height);

In the actual measurement, the user does not have to measure in the order of length, width and height. After the third measurement is completed, the instrument automatically calculates the volume. If the user thinks that the measurement data may be wrong, he can also short press OFF CLEAR key to return to the last measurement and re-measure.

Wall Area Measurement



(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ key to measure the height of the wall;

Press READ key to measure the width 1 of wall S1;

The instrument automatically calculates the area of the wall = height x width 1;
Press READ to measure the width of wall S2;
The instrument calculates the total area of the wall automatically;
Total area of the wall = height x (width 1+ width 2); By analogy, press READ key to measure the width of the wall n;
Total area of the wall = height x (width 1+ width 2+.....) + width n);

If the user thinks that the measurement data may be wrong, he can also short pres OFF CLEAR key to return to the last measurement and re-measure.

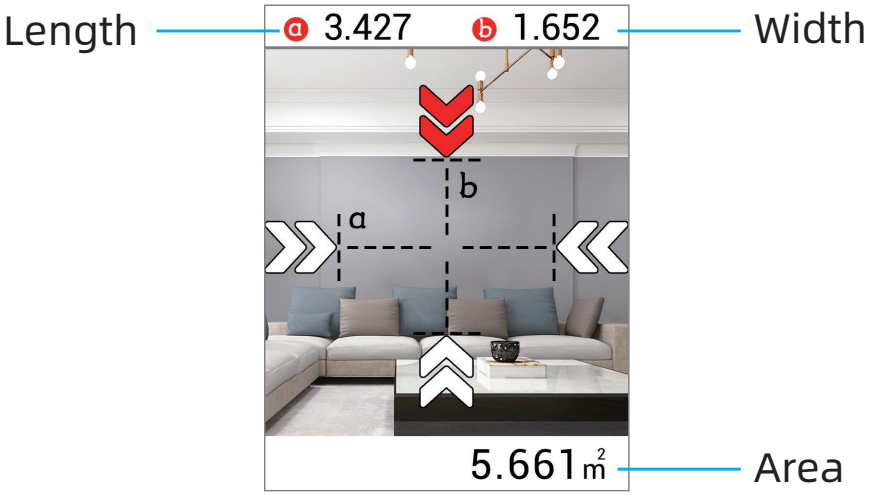
Camera Area Measurement

(Application scenario)

Select mode, function introduction: The user measures the distance to the target, and then adjusts the length (a) and width (b) through the camera to coincide with the length and width boundary of the target, the instrument automatically calculates the area of the target, the operation is as follows:

1. Aim at the measurement target to make the whole target appear in the camera frame;
Short press READ key to freeze the image frame; Four arrows are displayed on the screen. Adjust the arrow position by pressing + − to make it coincide with the target boundary;

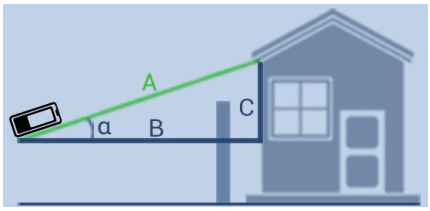
3. Short press Menu key to switch the arrow, and continue to adjust the arrow position to coincide with the target boundary;
4. After all arrows coincide with the target boundary, the target area is automatically calculated and displayed below;
5· Short press READ key or OFF CLEAR key to start the second measurement.



Pythagoras Measurement

Note: During triangle measurement, if ERR 5 appears on the screen, it indicates that the measurement data does not meet the triangle rule, such as the hypotenuse of a right triangle is smaller than the right side, and the user needs to measure again.

1. Get the height and horizontal distance of the right triangle (Angle&Height measurement)

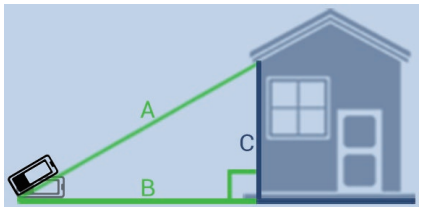


(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ key to measure the hypotenuse and dip angle of the right triangle;
After measuring the hypotenuse of a right triangle, the instrument calculates the height C and horizontal distance B of the right triangle based on the hypotenuse length and dip angle.

2. Get the height of a right triangle

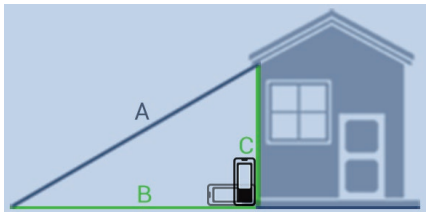


(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ key to measure the hypotenuse A of the right triangle;
Press READ to measure the leg B of the right triangle;
The instrument will automatically calculate the height C of the triangle after the second measurement;

3. Get the hypotenuse of a right triangle



(Application scenario)

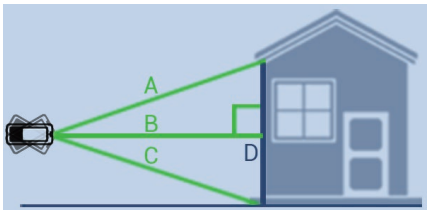
Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ key to measure the leg B of the right triangle;

Press READ key to measure the other leg C of the right triangle;

The instrument will automatically calculate the hypotenuse A of the triangle after the measurement.

4. Get the base sum of a triangle



(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

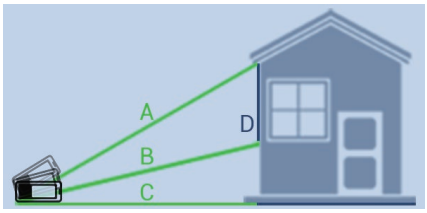
Press READ key to measure one side C of the triangle;

Press READ to measure the height B of the triangle;

Press READ to measure the other side A of the triangle;

The instrument will automatically calculate the third side D of the triangle after the measurement.

5. Triangle auxiliary line height measurement



(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

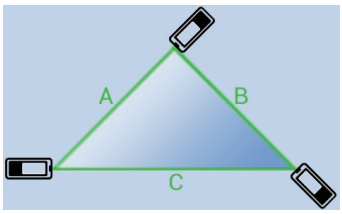
Press READ to measure one side A of the triangle;

Press READ to measure the auxiliary line length B of the triangle;

Press READ to measure the base C of the triangle;

The instrument will automatically calculate the auxiliary line height D of the triangle after the measurement.

Triangle Area Measurement



(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

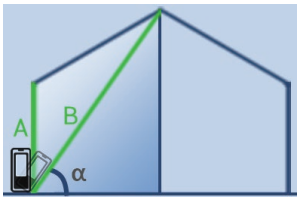
Press READ to measure the first side A of the triangle;

Press READ to measure the second side B of the triangle;

Press the READ key to measure the third side C of the triangle;

The instrument will automatically calculate the area S of the triangle after the measurement.

Trapezium Area Measurement



(Application scenario)

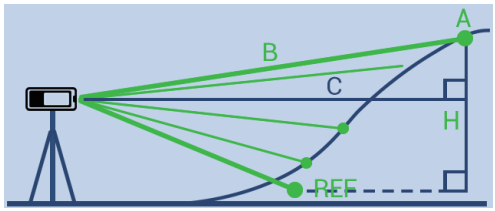
Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ to measure the first side A of the rectangle;

Press READ to measure the second side B of the rectangle and the angle α;

The instrument automatically calculates the area of the trapezium after the measurement.

Section Measurement



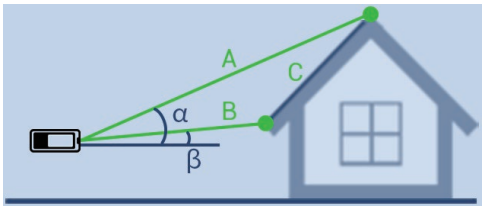
(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ to measure the distance from the instrument to the reference point REF;

Press READ key, the instrument starts automatic measurement, the screen displays the distance from the instrument to the target point and the horizontal difference from the instrument to the target point in real time. At the same time, the height difference between the target point and the reference point is displayed in the main display area below.

Slope Measurement



(Application scenario)

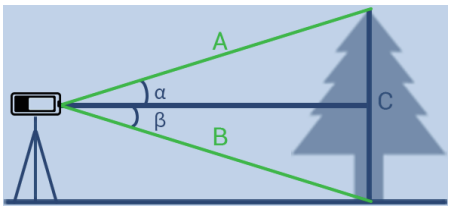
Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ to measure the first side A;

Press READ to measure the second side B;

The instrument will automatically calculate the height of slope C and the length of slope C after the measurement.

Height Tracking

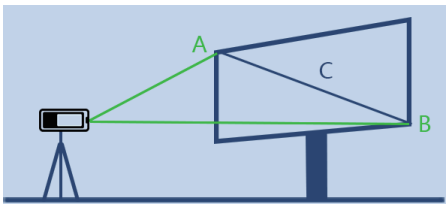


(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

Press READ key to measure side B, the screen shows the angle of B and the length of B ; Short press READ key again, and the instrument will start continuous measurement and measure the other side A. The screen displays the angle A and the absolute height difference between A-B in real time.

Measurement of Distance between Any Two Points in Space (Azimuth Measurement)



(Application scenario)

Select mode, the instrument enters the calibration state, the screen displays:

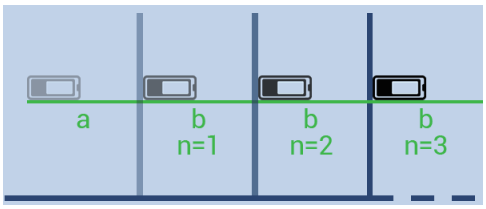
Please put the instrument at rest and wait for about 3s to complete the calibration, (if there is vibration during the period, the instrument cannot be calibrated), the user can short press OFF CLEAR key to exit the calibration. It is recommended to perform a calibration before starting the measurement to improve data accuracy. When the calibration is complete, follow the prompts to do the following operations:

Press READ to measure the distance from the instrument to point A;

Press READ to measure the distance from the instrument to point B;

The instrument automatically calculates the distance C between A and B.

Staking-out Measurement



(Application scenario)

Select mode, the screen displays , follow the prompts to complete the following operations.

1. After entering the staking-out mode, adjust the size of a by key (long press key to increase the adjustment range). After the adjustment is complete, press READ key and staking-out value a will be set.
2. After setting a, adjust the size of b by key (long press key to increase the adjustment range). After the adjustment is completed, press READ key, staking-out value b is set, and the instrument starts staking-out.

Staking-out mark:

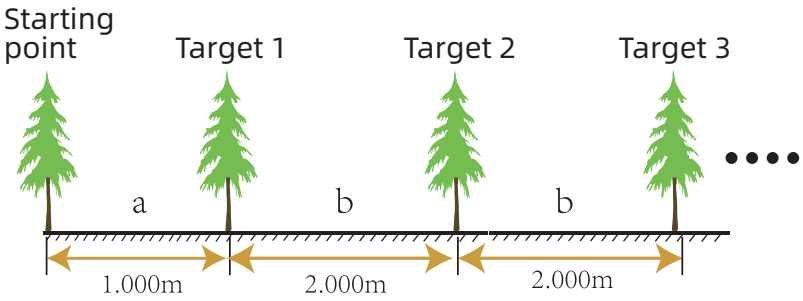
Do not reach the staking-out point, please move the instrument backward;

Beyond the staking-out point, please move the instrument forward;

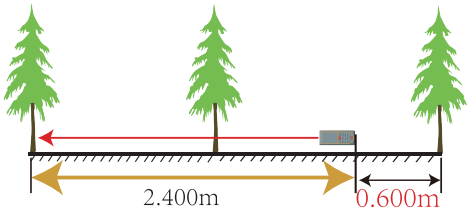
Reach the staking-out point.

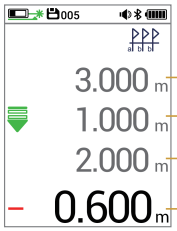
Exit staking-out: Press OFF CLEAR key to exit staking-out.

Function description:



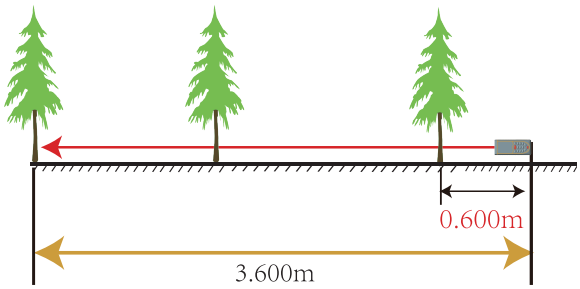
a=1.000m
b=2.000m
a、and b are set by the user
a、a and b can be equal/not equal

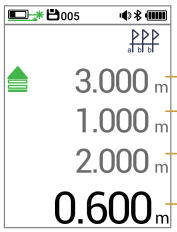




Distance from target 2 to the starting point
a
b
Indicates that the instrument moves back 0.6m to reach target 2

1) Actual distance=2.4



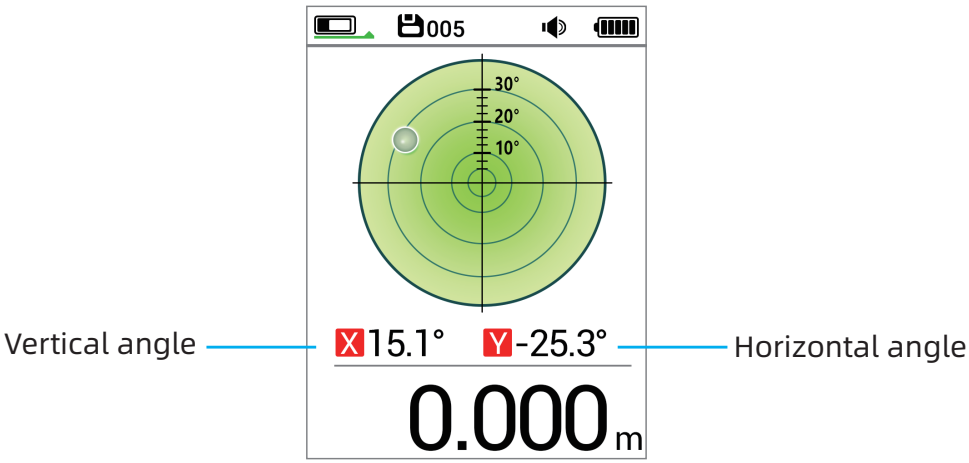


Distance from target 2 to the starting point
a
b
Indicates that the instrument moves forward 0.6m to reach target 2

1) Actual distance=3.6

Level Bubble Measurement

Select mode, the screen displays , follow the prompts to complete the following operations.
The universal electronic level bubble simulates the actual level bubble function and measures the tilt angle relative to the horizontal and vertical positions.



Distance Addition

Select mode and follow the prompts to complete the operation:

Step 1: Press READ key to turn on the laser, then press READ key, the main display area will display the measurement data;
Step 2: Press key, the instrument enters the addition measurement, and [+] is displayed on the left side of the lower end of the screen;

Step 3: Repeat Step 1, after the second measurement, the instrument will automatically sum. The auxiliary display area shows the first and second measurement data, and the main display area shows the sum of the two data.
Step 4: Repeat step 1, after each measurement, the instrument will continue to sum, the auxiliary display area shows the last sum data and the last measurement data, the main display area shows the sum of the two data.

Distance Subtraction

Select mode and follow the prompts to complete the operation:
Step 1: Press READ key to turn on the laser, then press READ key, the main display area will display the measurement data;
Step 2: Press key, the instrument enters the subtraction measurement, and [-] is displayed on the left side of the lower end of the screen;
Step 3: Repeat Step 1, after the second measurement, the instrument will automatically subtract. The auxiliary display area shows the first and second measurement data, and the main display area shows the difference of the two data;
Step 4: Repeat step 1, after each measurement, the instrument will continue to subtract, the auxiliary display area shows the last subtract data and the last measurement data, the main display area shows the difference of the two data.

Note: In the process of addition and subtraction, user can short press OFF CLEAR key to cancel the last value of addition and subtraction. Short press OFF CLEAR several times to exit the addition and subtraction state.

Area Addition & Subtraction

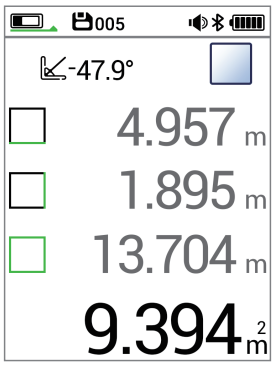


Figure 4 First measured area

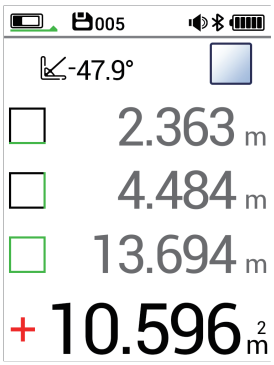


Figure 5 Second measured area

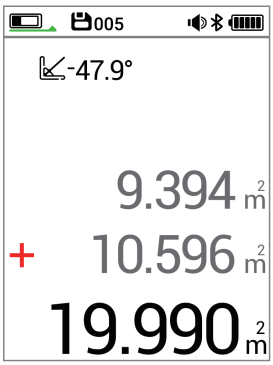


Figure 6 Sum of area

Step 1: Measure the first area (refer to area measurement), as shown in Figure 4;
Step 2: Short press to clear the data of screen, and [+] will be displayed in the main display area;
Step 3: Repeat step 1 to measure the second area, and the result is shown in Figure 5;
Step 4: Short press READ key, the instrument will automatically sum the two areas. The auxiliary display area will display the first and second area values, and the main display area will display the sum of the two areas, as shown in Figure 6.

Multiple addition: After completing step 3, repeat step 2 and step 3 to continue to add the next area. Finally, perform step 4 and the instrument will sum all the measured areas.

Note:The operation procedure of subtraction is similar to that of addition, so it will not be explained here.

Volume Addition & Subtraction

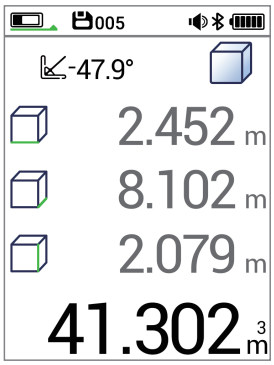


Figure 7 First measured volume

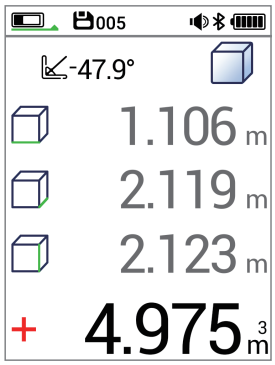


Figure 8 Second measured volume

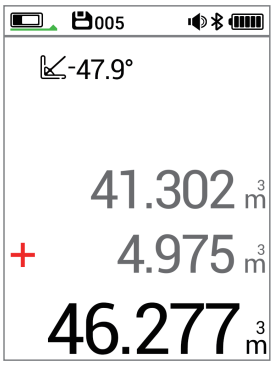


Figure 9 Sum of volume

Step 1: Measure the first volume (refer to volume measurement), as shown in Figure 7;
Step 2: Short press to clear the data of screen, and [+] will be displayed in the main display area;
Step 3: Repeat step 1 to measure the second volume, and the result is shown in Figure 8;
Step 4: Short press READ key, the instrument will automatically sum the two volumes. The auxiliary display area will display the first and second volume values, and the main display area will display the sum of the two volumes, as shown in Figure 9.

Multiple addition: After completing step 3, repeat step 2 and step 3 to continue to add the next volume. Finally, perform step 4 and the instrument will sum all the measured volumes.

Note:The operation procedure of subtraction is similar to that of addition, so it will not be explained here.

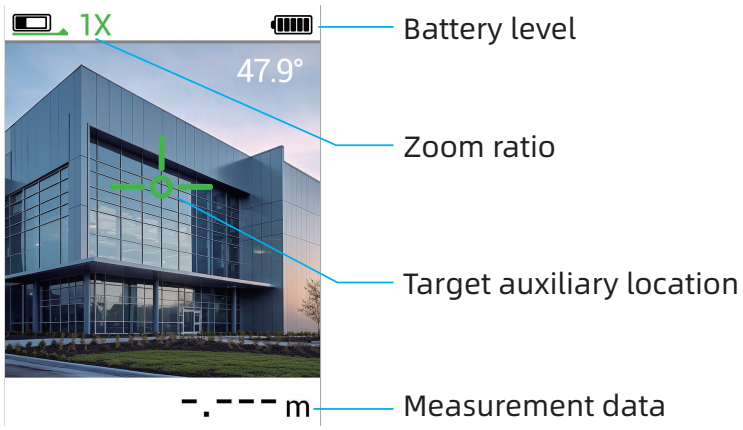
Save Records

After completing the measurement, the measurement results are automatically saved to the storage media. The maximum memory is 100 units, please refer to Menu Settings to view records.

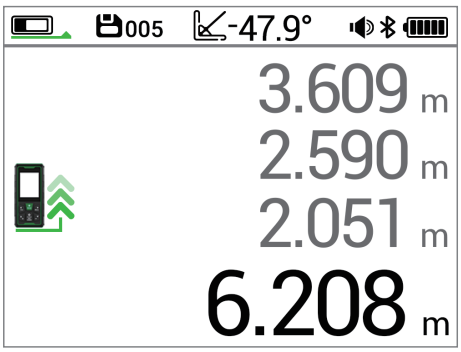
Camera Auxiliary Measuring

In strong sunlight, the laser cannot be identified with the naked eye. The user can measure the distance through the auxiliary measurement function, the operation is as follows:

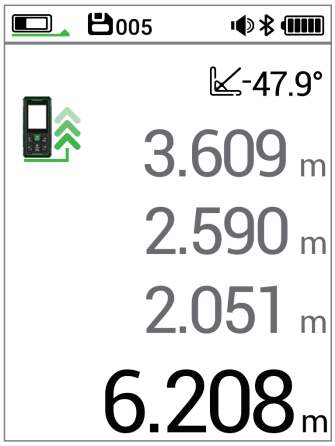
1. Enter auxiliary measurement: press key in measurement mode.
2. Measurement distance: Aim the center circle of the screen at the measurement target and make a single measurement. The measurement results are displayed at the bottom of the screen.
3. Zoom: Press Fun key to switch 1X/2X/4X. There are three zoom modes.
4. Exit auxiliary measurement: press or OFF CLEAR key to exit. If there is measurement data, press OFF CLEAR key several times until the data is cleared and exit.
5. Press key and the measured data will be displayed on the screen.



Automatic Screen Rotation and Locking



Horizontal display



Vertical display

- Automatic screen rotation: The instrument can automatically rotate the screen content according to the current direction. It supports 360° rotation and displays in 4 directions.
- Screen locking: Long press Menu key to lock/unlock the current screen orientation. When locked, the 🔒 icon is displayed.

Note: Electronic level bubble mode, azimuth mode and Camera Area mode do not support screen rotation.

Menu Settings

- **Menu operation**

1. Short press Menu key to enter the menu.
2. Short press + / − key to select options;
3. Short press READ key to enter the option setting;
4, Short press OFF CLEAR key to return to measurement interface;

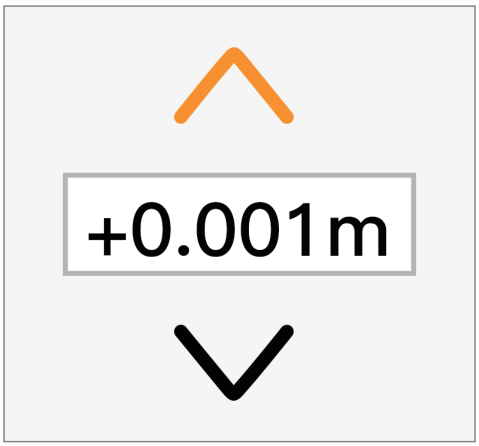
- **Option setting operation**

1. Short press + / − key to select different setting parameters;
2. Press READ key to confirm the current parameter;
3. Press OFF CLEAR key to return to the menu;

• Menu option

No.	Option	Parameter
1. Reference point		Front benchmark　Middle benchmark　Rear benchmark
2. Length unit	UNIT	0.000m、0.00m、0.00ft、0.0in、1/32in、0’00”
3. Angle unit	UNIT	° : Angle unit　% : Slope unit
4. Sound		Sound on　Sound off
5. Bluetooth		Bluetooth on　Bluetooth off
6. Delay		2s、5s、10s、30s、OFF（turn off delay function）
7. Backlight time		10s、30s、60s、ON（turn on backlight）
8. Laser-on time	OFF	20s、60s、120s
9. Shutdown time		auto-off in 2 minutes auto-off in 5 minutes No auto-off

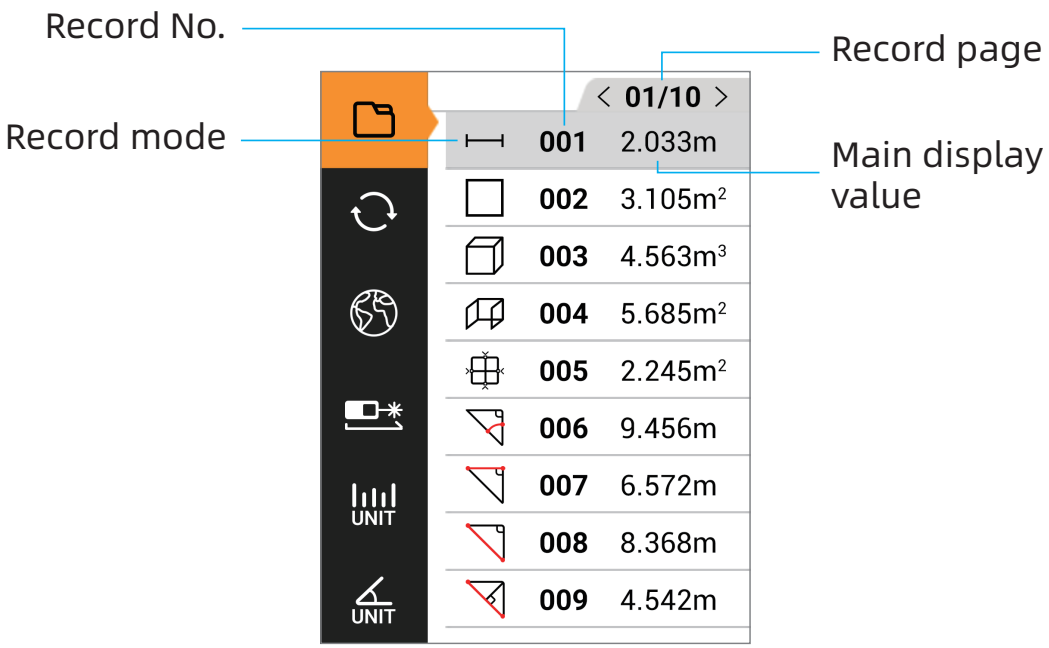
10. Self-calibration



The self-calibration function is mainly used to correct data. When the deviation occurs when the user measures the distance, the function can be used to correct the distance, the correction range: -0.009~0.009m. For example, if the user thinks that the value is larger by 2mm, the value can be adjusted to -0.002m to compensate 2mm; On the contrary, if it is 2mm smaller, it is adjusted to 0.002m. The operation is as follows:

Enter the self-calibration, short press [+] [-] to modify the self-calibration value, short press [READ] to save the modified value and return to the menu option.

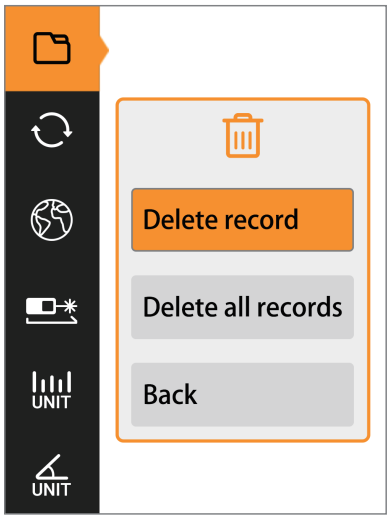
11. Viewing records



The operation is as follows:

Short press [+] [-] key to select the record;
Short press [Fun] [Menu] key to turn the page back and forth;
Short press [READ] key to view the record;
Short press [OFF CLEAR] key to return to menu option;
Short press [OFF CLEAR] key to enter the delete state;

Delete state is as follows:



Three options:

1）Delete a single record

2）Delete all records

3）Back to view records

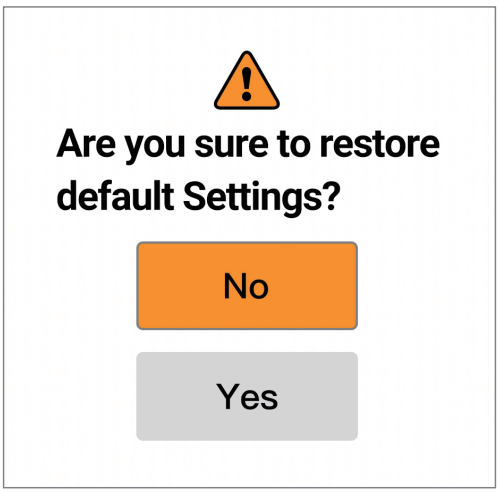
The operation is as follows:

Short press + − key to select the operation;

Short press READ key to perform the operation;

Short press OFF CLEAR to return to menu option;

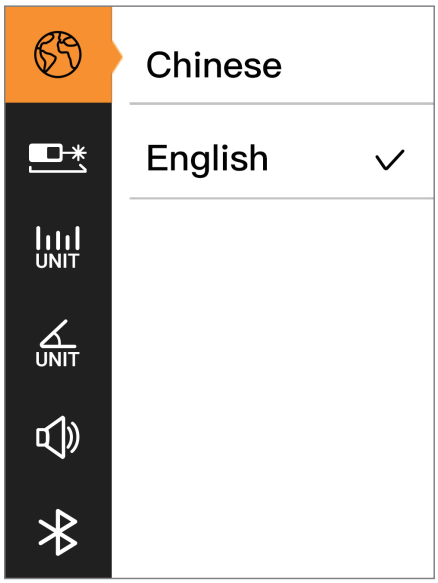
12. Default reset



The operation is as follows:

Short press ▲+ ▼− key to select the operation;
Short press the READ key to perform the operation. If Yes is selected, the instrument will be restored to default settings. If No is selected, the system returns;
Short press OFF CLEAR to return to the menu option;

13. Language settings



The operation is as follows:

Short press ▲+ ▼− key to select the operation;
Short press the READ key confirm your Language;
Short press OFF CLEAR to return to the menu option;

USB Connection Function

- The instrument provides USB computer connection function, and the WINDOWS software LDM Studio is provided in the official website software package, which is convenient for the measurement function of the instrument controlled by the computer. The stored records of the instrument can be downloaded, and can be printed and exported to EXCEL data sheets. Download the software from the official website: www.sndway.com.
- The instrument provides open USB HID communication function for users to develop the instrument for the second time. For the complete protocol, see the documentation in the package: USB-HID Command List EN vr.docx.

Installation and use steps:

1) This software does not need to be installed. Open the LDMStudio folder in the package and double-click the LDMStudio.exe file to run the software.

2) After running the software, connect the instrument to the computer with a USB cable. If the connection is successful, "Connection OK" is displayed at the lower left end of the page.

3) Click 

or 

button to control instrument measurement data or clear data;

4) If records are stored in the instrument, click 

to export the records in the instrument. After exporting records, user can click 

button to generate EXCEL documents, or click 

to print reports.

Error Message

When ERR × information appears on the instrument, it indicates that the instrument may not be able to perform correct measurements. The following is a list of possible error messages and solutions.

Error messages	Meaning & Solutions
ERR 1	Reflection signal is too weak, use the reflecting plate
ERR 2	Reflection signal is too strong, test different reflective surfaces
ERR 3	Low battery voltage, charge the battery
ERR 4	Memory error, return to factory for repair
ERR 5	Pythagoras error, remeasure
ERR 6	Out of measuring range
ERR 7	Camera error, return to factory repair
ERR 8	Angle sensor error, return to factory for repair

Technology Specifications:

ITEM	SW-80GQ	SW-120GQ	SW-150GQ	SW-200GQ
Working range	80m	120m	150m	200m
Precision	±(2mm+d *1/10000)*			
Display screen	2.4" IPS color screen			
Laser type & class	500-800nm , class II <1mW			
Bluetooth	√			
Area/volume measurement	√			
Wall area measurement	√			
Pythagorean measurement	√			
Angle& Height measurement	√			
Add/Subtract measurement	√			
Area&Volume addition/ subtraction	√			
Min/Max value	√			
Delay measurement	√			
Self-calibration	√			
Camera area measurement	√			
Trapezoidal measurement	√			
Reference height measurement	√			
Roof slope measurement	√			
Height tracking measurement	√			
Azimuth measurement	√			
Staking-out measurement	√			
Electronic level bubble	√			
Auto screen rotation	√			
Angle range	±90°			
Angle accuracy	±1°			
Back copper nut	1/4" copper nut			
Protection grade	IP68			
Auto laser off	20s(changeable)			
Auto switch off	300s(changeable)			
Max storage	100 units			

Battery	3.7V 2000mAh lithium battery
Charging Specification	DC5V 1A Type-C
Type-C charging	About 3h
Battery life	5500 times of measures when camera mode is off; 3500 times of measures under camera mode
Storage temperature	-20℃~60℃
Working temperature	0℃~40℃
Storage humidity	20%~80%RH
Dimension	128x60x29.5mm

* Please contact the manufacturer to provide the Bluetooth APP

* "d" indicates the actual distance

** In harsh environment, such as: sunlight is too strong, the ambient temperature fluctuates excessively, the reflection effect of the obiect's surface is weak, the battery is low, then the measurement results will have a large error, so a reflecting plate is needed.

Instrument Maintenance:

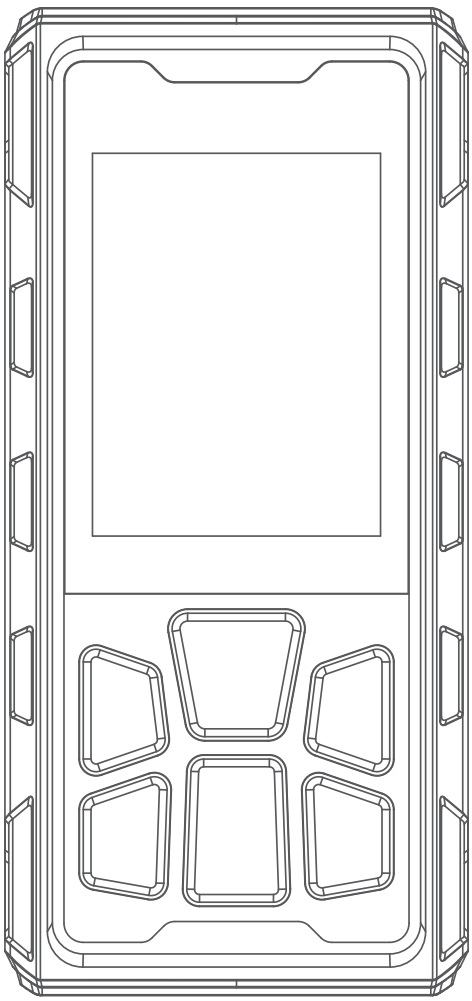
- The meter should not be stored in high temperature and strong humidity environment for long time; if it is not used very often, please place the meter in the potable bag and store it in cool and dry place.

- Please keep the device surface cleaning. Wet soft cloth is applied to clean dust, but erosion liquid is not allowed to use for the meter maintenance. Laser window and focus lens can be maintained according to maintenance procedures for optical device.

Packing List

Please check if the accessories are completed according to the below list.

NO.	Item	Unit	QTY	Note
1	Laser distance meter	pc	1	
2	Portable bag	pc	1	
3	Hand strap	pc	1	
4	Reflector	pc	1	
5	User manual	pc	1	
6	Gift box	pc	1	
7	USB Type-C	pc	1	



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