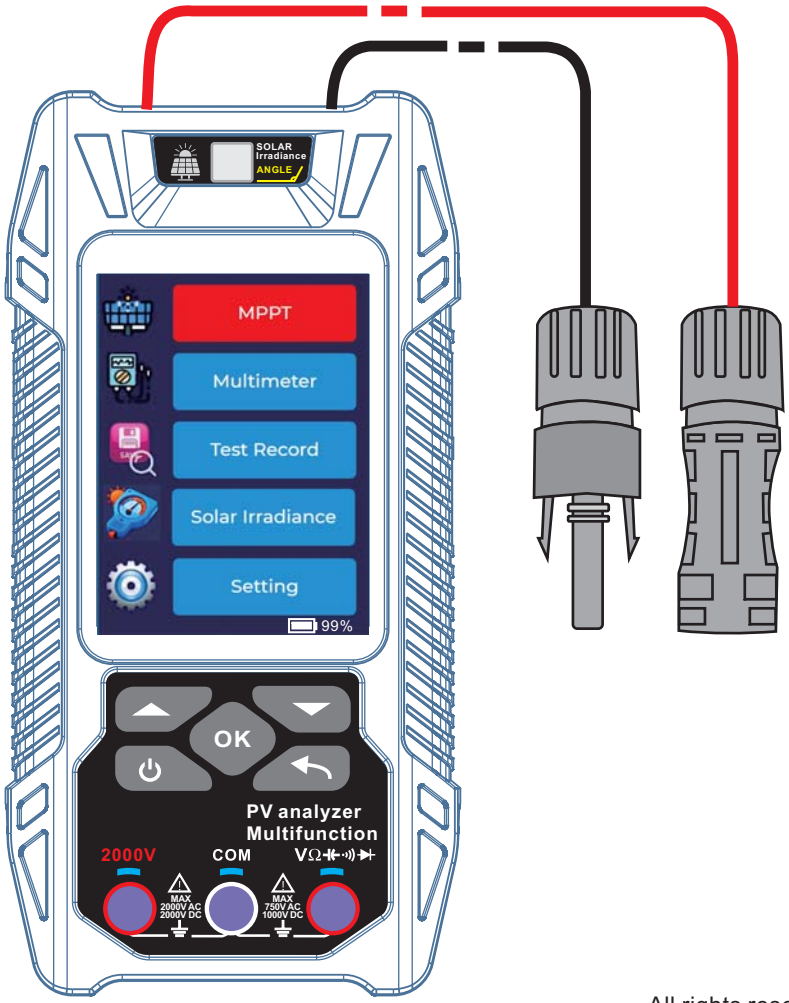
# 光伏综合测试仪
PV analyzer Multifunction

# 产品手册 *Manuals*

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# 安全须知

本产品采用IEC1010条款设计(国际电工委员会颁布的安全标准)，使用之前请先阅读安全注意事项及技术指标

测量大于36V请仔细阅读产品技术指标内容，在遵循安全操作要求的前提下，可以测量超过36V以上的交流/直流电压及电流

1、36V以下的电压为安全电压，在测高于36V直流、25V交流电压时，要检查表笔是否接触可靠，是否正确连接，是否绝缘良好等，以避免被电击；

2、万用表测量电压时，高于1000V电压请选择2000V功能输入孔，最高可测量2000V电压。此产品不能测量电流；

3、更换功能和量程时，表笔应离开测试点；

4、选择正确的功能和量程，谨防误操作，该系列仪表虽然有全量程保护功能，但为了安全起见，仍请您多加注意；

## ⚠ 警 告 ⚠

1、不要随意拆开机壳、有故障请专业人员维修；

2、在每次使用前,要确保产品无损坏。请您确保所用的表笔是完好的状态；

3、太阳能板连接口最高只能输入90 VDC,高于此电压或输入交流电压会烧坏产品；

4、万用表功能操作需严格遵照万用表使用规程，除万用表笔外，其他接口不能连接强电,否则有人员伤　和设备损坏风险；

5、操作万用表功能时，需按产品输入指示连接，本产品不能测量电流；

6、注意电池使用情况，当屏幕显示出现低电压符号时，应及时充电；

7、不要在高温、高温、易燃和强电磁场环境中存放或使用仪表；

8、用户长时间不使用，请充满电存储。



# 产品特性

1：MPPT最大功率点测量,数据自动保存

2：热辐照功能可测量0~2000W/m²

3：倾角测试可达-90~90°

4：超大屏幕显示47*63mm,各种测量结果一屏显示

5：过功率/过压/过流/反接/过温全面保护，TPR保护防跌损设计

6：MPPT功率测量范围高达2000W,最小功率3W，最低电压3V

7：大容量1500mA.H可充锂电池

8：自动关机/亮度/声音多功能设置

9：带2000V高压测量的60000位多功能光伏万用表

10：3.2寸(240*320分辨率）显示屏及多语言可设置

# 简　介

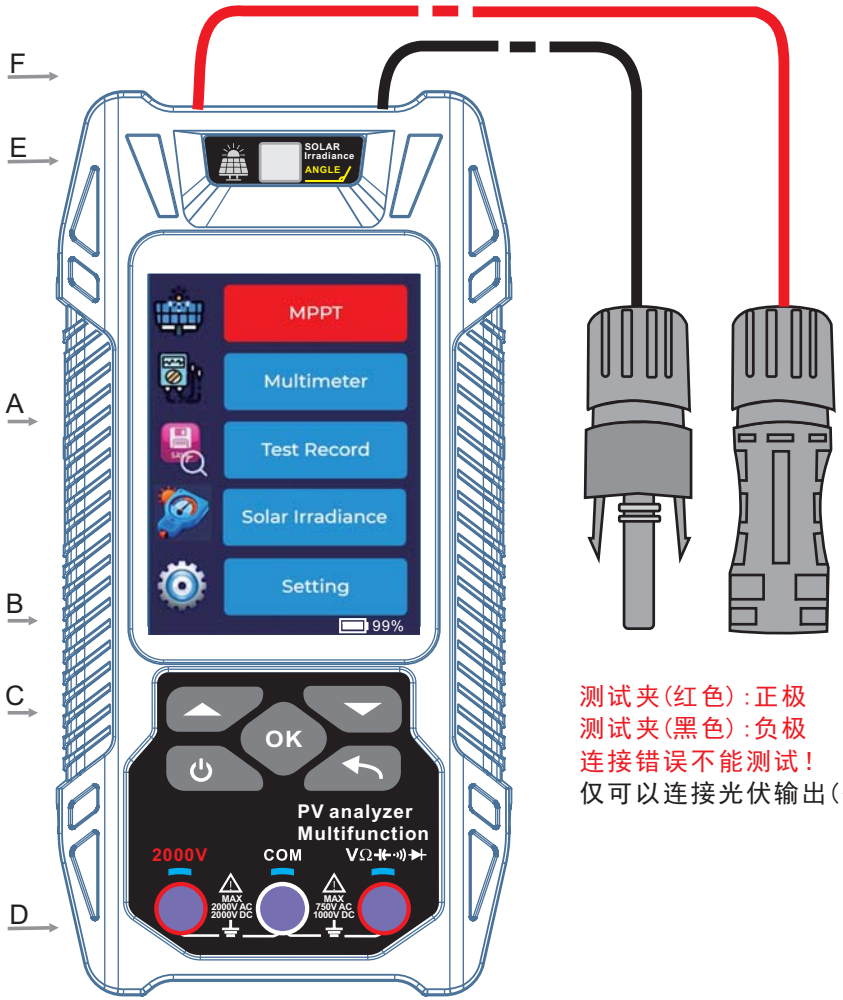
本光伏组件测试仪是一款专为现场检测设计的高效便携设备，核心功能包括MPPT最大功率点测试，可精准测量Pmppt、Voc、Isc等关键参数（精度±1.5%），支持2000W大功率组件测试。同时搭载热辐照测量功能，测试范围0~2000W/m²，满足光伏现场环境检测需求；具备倾角测试功能，测量角度范围-90°~90°，适配不同安装场景检测，为用户提供精准、快速、可靠的测量体验。

产品亮点：便携耐用、多重安全防护（过压/过流/反接/过温保护+CE认证），搭配TPR防跌损设计，使用更安全。配备1500mAh可充电锂电池，适合工业环境长时间使用。仪器具备60000位高精度读数与2000V高压万用表功能，支持数据自动保存、大屏一屏显示、多语言设置，操作便捷。

产品广泛适用于光伏组件生产检测、工程验收及日常运营维护，可快速诊断故障，大幅提升现场检测效率。

# 产品介绍

A. 显示屏
B. TYPE-C USB充电口
C. 操作按键
D. 万用表输入插孔
E. 辐照传感器测试窗口
F. 太阳能板连接口



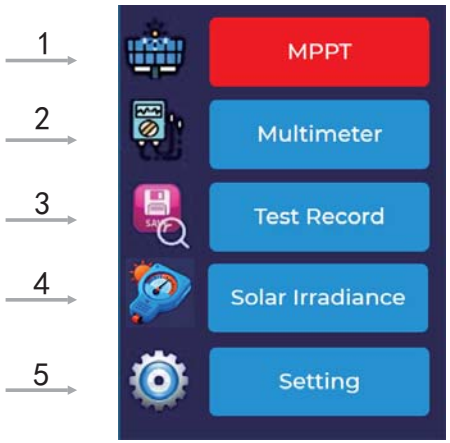

测试夹(红色):正极
测试夹(黑色):负极
连接错误不能测试!
仅可以连接光伏输出(<90VDC)



# 产品介绍

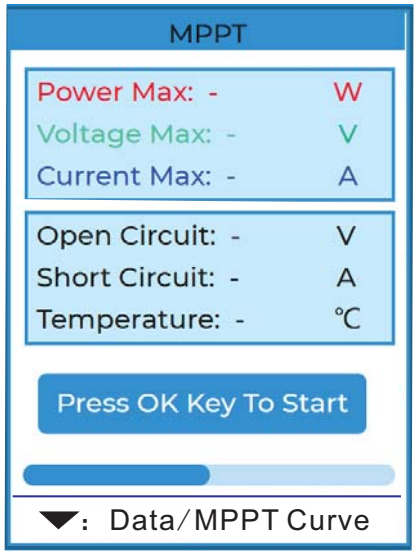
产品具有多功能，开机后将进入主菜单窗口，窗口列出产品功能；
单击或长按▲/▼键选择功能，单击OK键进入功能；
进入功能操作窗口中，点击↖回到主菜单功能选择窗口.

## 主菜单显示




1. MPPT最大功率点测试
2. 光伏万用表功能
3. 数据回读
4. 辐照/倾角测试
5. 用户设置

## 光伏板最大功率点测试(MPPT)




### MPPT测试窗口

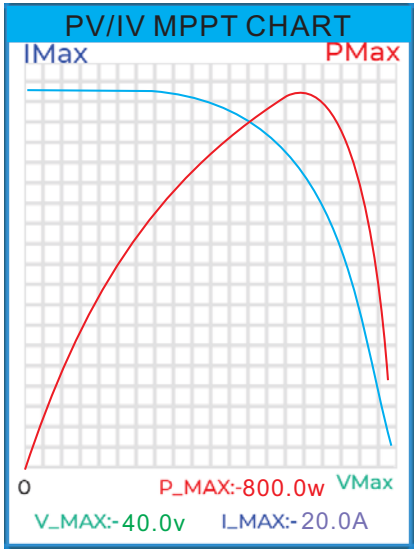
单击OK键，产品开始测试MPPT最大功率点，等待进度提示条由红色“测试中”转换成蓝色即完成一次测量；

窗口分别显示MPPT最大功率值 /最大功率点电压/最大功率点电流以及开路电压/短路电流和产品温度；

单▼键依次切换显示：MPPT单次测试采样数据组 --》 MPPT曲线 --》 MPPT测试数据记录；

点击↖回到主菜单功能选择窗口；

产品具有高温保护设计，当温度高于60度时，请等待产品降至低于60度时方可进行MPPT测试




### MPPT曲线窗口

完成一次MPPT最大功率点测试后，产品根据测试数据绘制出最大功率点曲线和电流曲线；





## 数据记录(Test Record)

Test Record

| No | Voltage | Current | Power |
|---|---|---|---|
| 1 | 27.2v | 17.8A | 485W |
| 2 | 28.2v | 16.9A | 478W |
| 3 | 27.8v | 16.7A | 465W |
| 4 | 29.1v | 14.6A | 426W |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |

每完成一次MPPT最大功率点测试后，产品自动记录下当前测试数据，重开机后，用户仍可以回读相关记录；

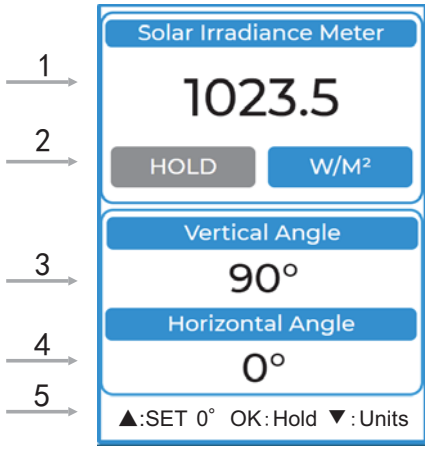
数据记录最多可以存储100条

## 辐照度/倾角测试(Solar Irradiance)

产品辐照强度功能，通过精密传感器实时测试阳光辐照强度；

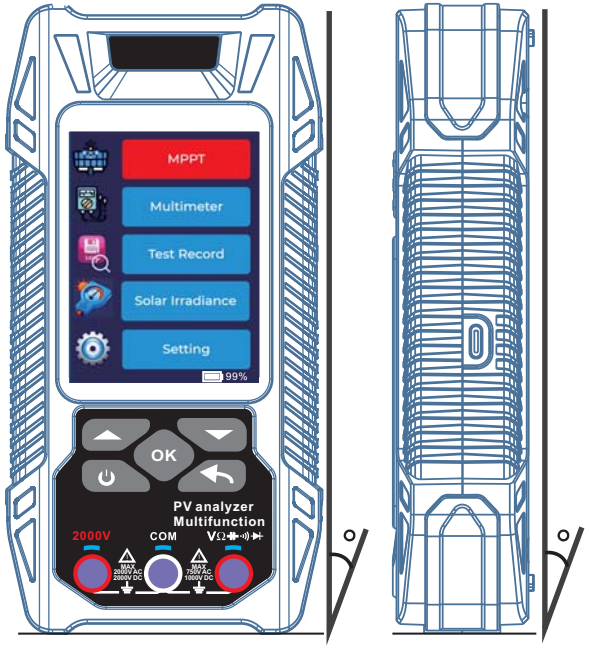
倾角功能可以测量Y轴(垂直角度)和X轴(水平角度)。按▲键设定角度偏移，如15° 平面为基准，角度为30° 时，显示为[ZERO:15]30°

按OK:保持当前结果。 按▼键切换辐照数据单位。




1. 光辐照测量结果
2. 保护状态/单位
3. 垂直角度(Y轴)
4. 水平角度(X轴)
5. 操作提示

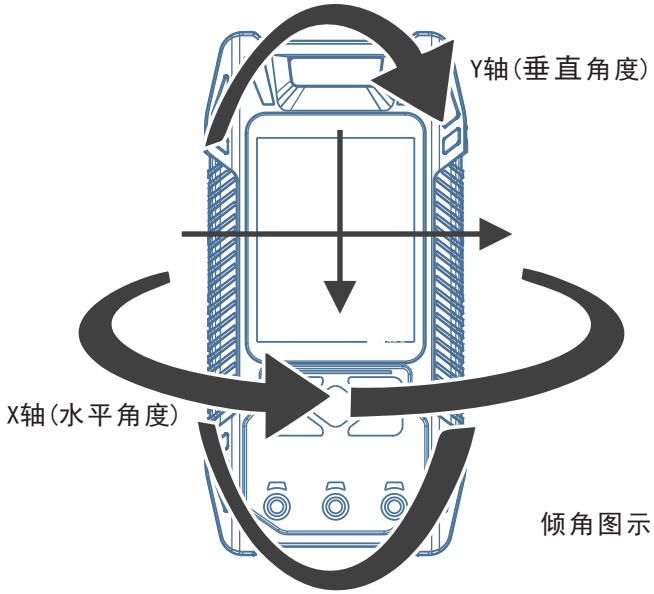
## 倾角测试基准




X轴(水平角度)基准　　Y轴(垂直角度)基准

测量倾角时，以下面位置为参考基准，测量倾角。

用户不确定安装平面是否为绝对水平面时，可按▲：设置0度，后续测量以此平面为基准。




倾角图示



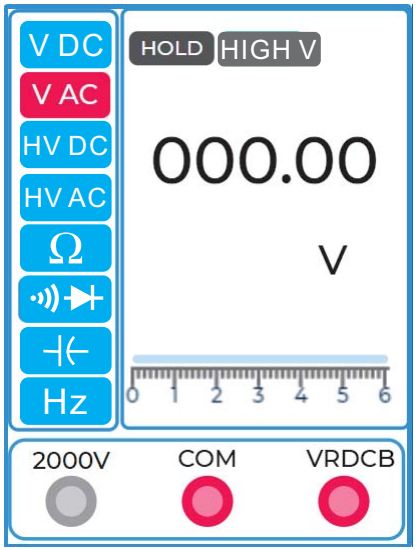


## 光伏万用表（Multimeter）

光伏万用表具有多功能和60000位读数特点，功能和精度都可媲美专业万用表。 产品具有交流电压、直流电压、通断蜂鸣、二极管、电阻、电容、频率功能；按▲/▼键切换选择功能；

HVDC/HVAC 2000V高压测试功能，光仪工程检测中的实用功能。

用户使用万用表时，需严格按提示连接插入万用表，否则可能会烧坏产品；

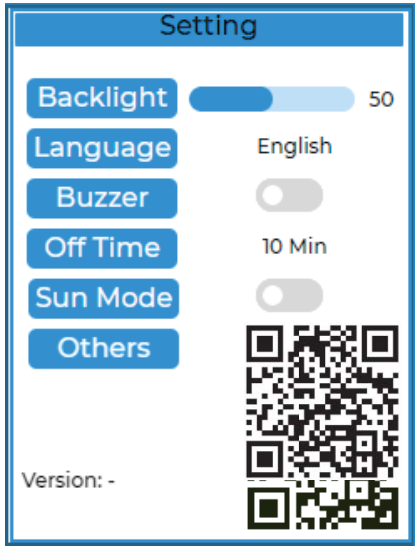



⚠Warning

请按照提示插入测试表笔，否则将会损坏设备

# 产品功能

## 用户设置（SETUP）




用户可根据需求，设置产品背光亮度/语言/喇叭/自动关机时间/阳光模式以及恢复出厂设置，完成设置后，重新开机即生效；

阳光模式：是在强烈太阳光照下的理想显示模式，设置后，仅会在MPPT功能下有显示增强。

## 常见问题

一：无法开机
请连接充电器，给产品进入充分充电后开机操作；
二：无法测试MPPT
A:请检查是否正负连接正确
B:是否电压超出测试范围
C:产品温度是否过高；
三：MPPT结果偏小
A:检查测试线是否安装到位并扭紧；
B:光伏板功率偏小
C:太阳光光线阴暗；
四：按键无声音或屏幕太暗
请操作用户设置中相应选择开启声音和设置亮度设置或操作恢复出厂设置；



# 技术指标

| 功能 | |
|---|---|
| MPPT最大功率点 | |
| 电压测量 | 3~90.00V/±1.5%+5 |
| 电流测量 | 0~40.00A/±1.5%+5 |
| 光伏板功率 | 0~2000.0W/±1%+5 |
| 采样点 | 1000点 |
| 测试曲线 | MPPT最大功率点曲线/V:绿色/A:蓝色/W:红色 |
| 辐照度 | 0~2000W/m²(Btu/(ft2*h))/5%+20 |
| 倾角 | 量程：-90~90°<br>精度：±1.5°(-50°至+50°范围内)/±3°（其余角度范围） |
| 数据记录 | 100条 |
| 显　　示 | 3.2寸 240*320点阵屏 |
| 供电电池 | 1500mA.H锂电 |
| 测量接口 | MC4接口 |
| 保护 | 过压保护/反接保护/过流保护/过温保护 |
| 其　　他 | 自动关机、低电压检测<br>多语言菜单、表笔提示 |
| 万用表功能 | （60000位显示） |
| 直流高压 | 2000V(±0.8%+0.8) |
| 交流高压 | 2000V(±1.5%+0.5) |
| 直流电压 | 6.0000V~1000V(±0.5%+0.3) |
| 交流电压 | 6.0000V~750V(±0.8%+0.5) |
| 电　　阻 | 600.00Ω~60 MΩ(±1%+0.6) |
| 电　　容 | 6.0000nF~60 MF(±2%+0.6) |
| 频　　率 | 6.0000Hz~6 MHZ(±1%+0.1) |
| 通断蜂鸣 | ＜50Ω蜂鸣/610Ω以上显OL |
| 二 极 管 | 0.0000~3.3000v,3.3v以上显OL |
| 工作环境 | 温度：0~40℃ / 湿度：0~30℃以下≤75%, 30~40℃≤50% |
| 存储环境 | 温度：-10~50℃ / 湿度：≤50% |
| 包装 | 彩盒/说明书/太阳能测试夹<br>工具包/万用表笔 |
| 电源规格<br>Power | 1500mA.H可充电锂电池（带保护电路）<br>需要5V/2A/10W或以上充电器充电（不标配） |

*上述指标是功能最佳指标/检测温度：23±2℃湿度<70%）

# Safety Tips

This product is designed according to IEC1010 (safety standards issued by the International Electrotechnical Commission). Please read the safety precautions and technical indicators before use.

Please read the product technical specifications carefully when measuring voltages greater than 36V. Under the premise of following the safety operation requirements, you can measure AC/DC voltages and currents exceeding 36V.

1. Voltages below 36V are safe voltages. When measuring voltages higher than 36V DC or 25V AC, check whether the test leads are in reliable contact, correctly connected, and well insulated to avoid electric shock.

2. When measuring voltage with a multimeter, if the voltage is higher than 1000V, please select the 2000V function input port. The maximum voltage that can be measured is 2000V. This product cannot measure current;

3. When changing the function and range, the test lead should be away from the test point;

4. Select the correct function and range, and be careful to avoid misoperation. Although this series of instruments has full-range protection function, for the sake of safety, please still pay more attention;

## ⚠ Warning ⚠

1. Do not disassemble the casing at will. If there is any fault, please ask a professional to repair it.

2. Before each use, make sure the product is not damaged. Please make sure the test leads are in good condition.

3. The solar panel connection port can only input a maximum of 90 VDC. Inputting a voltage higher than this or an AC voltage will burn the product.

4. The multimeter function operation must strictly follow the multimeter usage regulations. Except for the multimeter probe, other interfaces cannot be connected to strong electricity, otherwise there is a risk of personal injury and equipment damage;

5. When operating the multimeter function, you need to connect according to the product input instructions. This product cannot measure current;

6. Pay attention to the battery usage. When the low voltage symbol appears on the screen, charge it in time.

7. Do not store or use the instrument in high temperature, hot, flammable and strong electromagnetic field environments;

8. If the user does not use it for a long time, please fully charge it for storage.

warn



# Product Features

1. MPPT maximum power point measurement with automatic data saving
2. Solar irradiance measurement function, range: 0~2000W/m²
3. Inclination test range: -90°~90°
4. Extra-large 47*63mm display, showing all measurement results on one screen
5. Comprehensive protection against over-power, over-voltage, over-current, reverse connection and over-temperature; TPR shockproof design for drop resistance
6. MPPT power measurement range up to 2000W, minimum power 3W, minimum voltage 3V
7. Large-capacity 1500mAh rechargeable lithium battery
8. Multi-function settings: auto power-off, brightness adjustment, sound control
9. 60000-count multifunctional PV multimeter with 2000V high-voltage measurement
10. 3.2-inch display (240*320 resolution) with multi-language settings

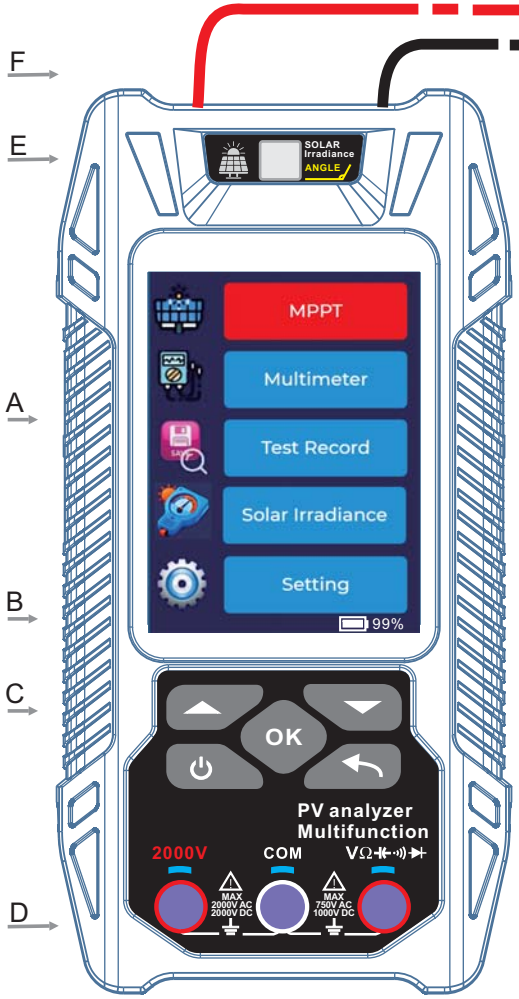
# Introduction

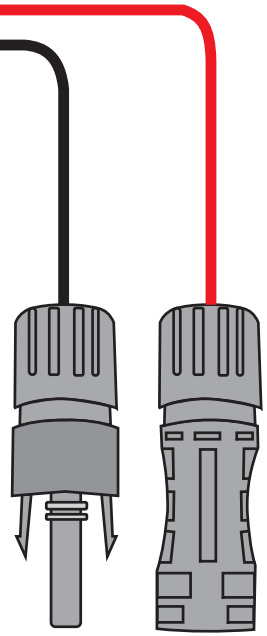
This PV module tester is a highly efficient and portable device designed specifically for on-site testing. Its core functions include MPPT maximum power point testing, which can accurately measure key parameters such as Pmppt, Voc, and Isc (with an accuracy of ±1.5%), and supports testing of high-power modules up to 2000W. It is also equipped with a solar irradiance measurement function, with a testing range of 0~2000W/m² to meet the needs of photovoltaic on-site environmental detection. Additionally, it features an inclination test function with a measurement angle range of -90°~90°, adapting to testing in different installation scenarios, providing users with an accurate, fast and reliable measurement experience.

Product Highlights: Portable and durable, with multiple safety protections (over-voltage/over-current/reverse connection/over-temperature protection + CE certification) and a TPR anti-drop design for safer operation. Equipped with a 1500mAh rechargeable lithium battery, it is suitable for long-term use in industrial environments. The instrument features 60,000-count high-precision readings and a 2000V high-voltage multimeter function, supporting automatic data saving, single-screen full-display, and multi-language settings for easy operation.

The product is widely used in PV module production testing, project acceptance, and daily operation and maintenance, enabling rapid fault diagnosis and significantly improving on-site testing efficiency.

A.Display
B.TYPE-C USB charging port
C. Operation buttons
D. Multimeter input jack
E. Irradiation Sensor Test Window
F. Solar panel connection port



Test clip (red): positive electrode
Test clip (black): negative electrode
Connection error, unable to test!
Only capable of connecting to photovoltaic output (<90VDC)



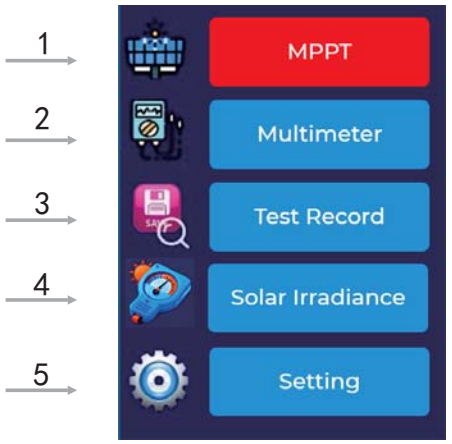


The product features multiple functions. After power-on, it will enter the main menu window, which lists all product functions.

Press or long-press the ▲/▼ keys to select a function, and press the OK key to enter the selected function.

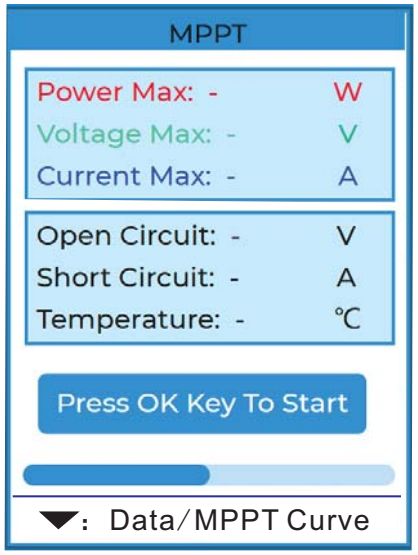
In the function operation window, press ↖ to return to the main menu function selection window.

## Main Menu Display




1. MPPT Max Power Point Test
2. HV Multimeter
3. Data Readback
4. Irradiation / Inclination Test
5. User Settings

## MPPT Max Power Point Test(MPPT)




MPPT Test Window

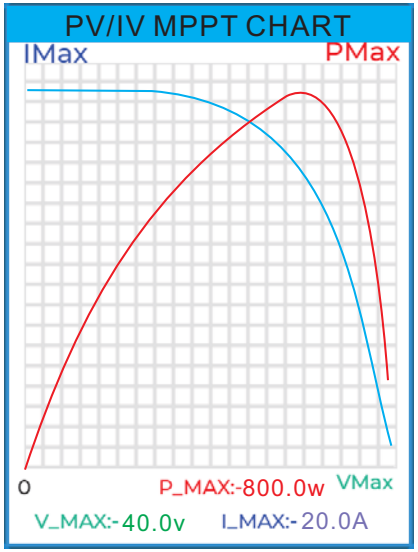
Press the OK key to start the MPPT maximum power point test. Wait until the progress bar changes from red "Testing" to blue to complete one measurement.

The window displays the MPPT maximum power, MPPT voltage at maximum power, MPPT current at maximum power, as well as open-circuit voltage, short-circuit current, and device temperature.

Press the ▼ key to switch displays in sequence:
MPPT single-test sampling data set → MPPT curve → MPPT test data record.

Press ↖ to return to the main menu function selection window.

The device features high-temperature protection. When the temperature exceeds 60°C, please wait until it drops below 60°C before performing MPPT testing.




MPPT Curve Window

After completing one MPPT maximum power point test, the device will generate the maximum power point curve and current curve based on the test data.





## Data Readback(Test Record)

Test Record

| No | Voltage | Current | Power |
|---|---|---|---|
| 1 | 27.2v | 17.8A | 485W |
| 2 | 28.2v | 16.9A | 478W |
| 3 | 27.8v | 16.7A | 465W |
| 4 | 29.1v | 14.6A | 426W |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |

After each MPPT maximum power point test, the device automatically records the current test data. Users can still read back the relevant records after restarting the device.

Maximum of 100 data records can be stored.

## Irradiation / Inclination Test

Irradiation Intensity Function:

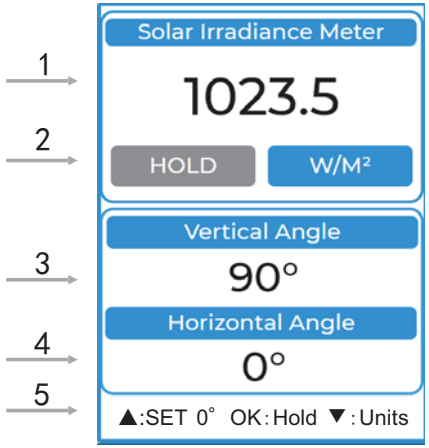
The product measures solar irradiation intensity in real time via a precision sensor.

Inclination Function:

Measures the Y-axis (vertical angle) and X-axis (horizontal angle).

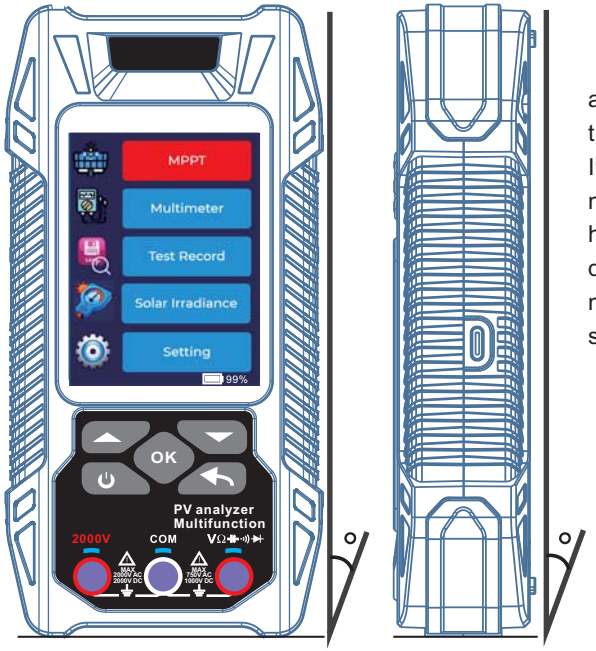
Press the ▲ key to set the angle offset.For example, if the reference plane is 15°, when the angle is 30°, the display shows [ZERO:15] 30°.

Press OK: Lock the current result.Press ▼: Switch the irradiation data unit.




1. Solar Irradiation Result
2. Protection Status / Unit
3. Vertical Angle (Y-axis)
4. Horizontal Angle (X-axis)
5. Operation Prompt

## Inclination Test Reference

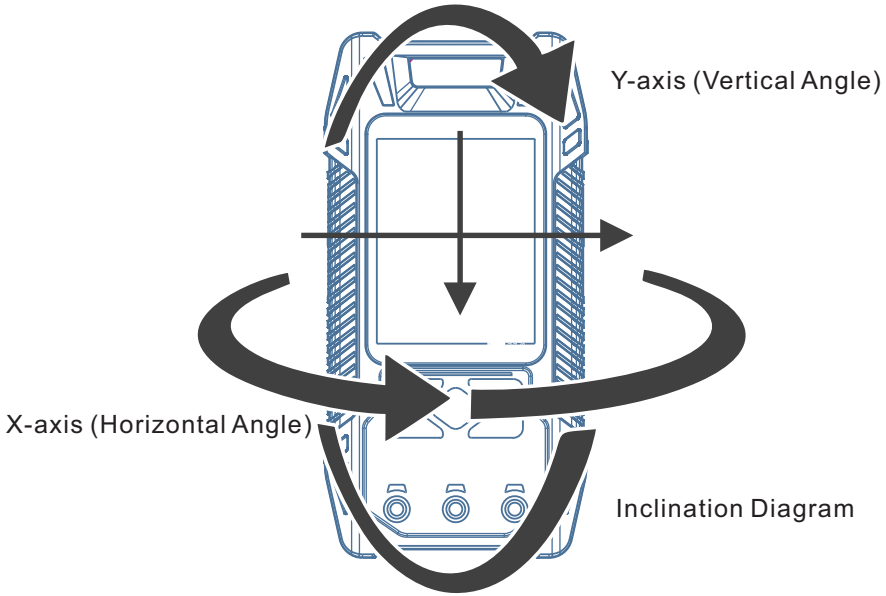



X-axis (Horizontal Angle) Reference



Y-axis (Vertical Angle) Reference

When measuring the inclination angle, use the following position as the reference datum.
If the user is unsure whether the mounting surface is absolutely horizontal, press ▲ to set 0 degrees; subsequent measurements will be based on this surface.




Inclination Diagram





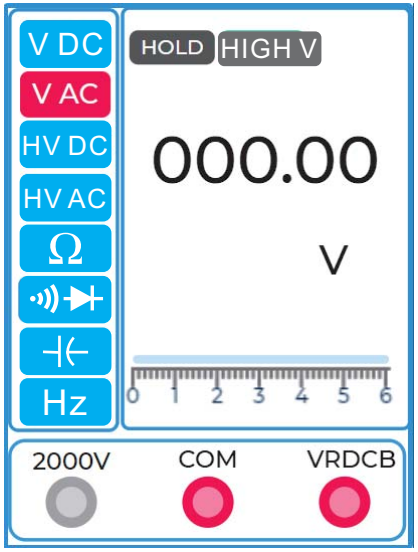
## HV Multimeter

The HV multimeter has multi-functions and 60,000-digit readings, and its functions and accuracy are comparable to those of professional multimeters. The product has AC voltage, DC voltage, on/off beeping, diode, resistance, capacitance, and frequency functions;

The 2000V high voltage test function is a practical function in optical instrument detection.

When the user is operating, press the up and down keys to switch the selection function;

When using a multimeter , users must strictly follow the instructions to connect and insert the multimeter , otherwise the product may be burned;

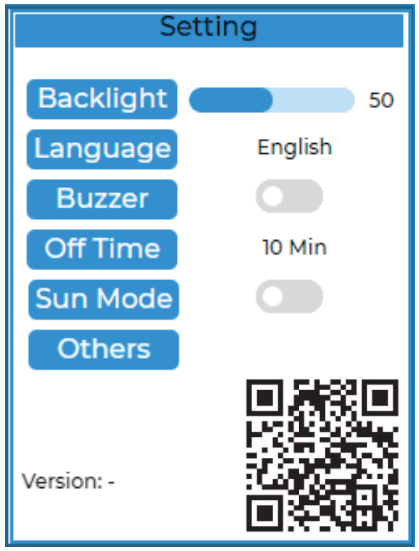



⚠Warning

Please insert the test probes as prompted, otherwise the device will be damaged.

# Product Operation

## User settings (SETUP)




Users can set the product's backlight brightness, language, speaker, Sunlight mode,automatic shutdown time, and restore factory settings according to their needs.

After completing the settings, rebooting the device will take effect;

Sunlight mode: It is an ideal display mode under strong sunlight. After setting, it will only enhance the display under MPPT function.

## FAQ

1 : Unable to boot

Please connect the charger and fully charge the product before turning it on;

2. Unable to test MPPT

A: Please check whether the positive and negative connections are correct.

B: Is the voltage outside the test range?

C: Is the product temperature too high?

3. MPPT results are too small

A: Check whether the test line is installed in place and tightened ;

B: Photovoltaic panel power is too low

C: Sunlight is dim;

4. No sound when pressing keys or the screen is too dark

Please select the corresponding options in the user settings to turn on the sound and set the brightness, or restore the factory settings;



# Technical Specifications

| Functions | |
|---|---|
| MPPT Test | |
| Solar Voltage | 3~90.00V/±1.5%+5 |
| Solar Current | 0~40.00A/±1.5%+5 |
| Solar MPPT power | 0~2000.0W/±1%+5 |
| Sampling point | 1000digit group |
| MPPT curve | MPPT Curve/V:Green/A:Blue/W:Red |
| Irradiance | ~2000W/m²(Btu/(ft2*h))/5%+20 |
| Inclination | Range: -90~90°<br>Accuracy: ±1.5° (-50° to +50°) / ±3° (others) |
| Data record | 100 |
| Battery | 1500mA.H 3.7V |
| Display | 3. 2ft/240*320 |
| Interface | MC4 |
| Protect | Over voltage/reverse polarity/over current/over temperature |
| OTHER | Automatic shutdown/ Low voltage detection<br>Multi-language menu / Pen prompt |
| DMM Function | √ (60000 COUNT) |
| HIGH DCV | 2000V(±0.8%+0.8) |
| HIGH ACV | 2000V(±1.5%+0.5) |
| DC Voltage/DCV | 6.0000V~1000V(±0.5%+0.3) |
| AC Voltage/ACV | 6.0000V~750V(±0.8%+0.5) |
| Resistance/R | 600.00Ω~60 MΩ(±1%+0.6) |
| Capacitance/CAP | 6.0000nF~60 MF(±2%+0.6) |
| Frequency/Hz | 6.0000Hz~6 MHZ(±1%+0.1) |
| Continuity Test | < 50Ω buzzing / >610Ω:OL |
| Diode Test | 0.0000~3.3000v,>3.3v:OL |
| Working ENV | Temperature：0~40℃/Humidity：0~30℃:≤75%,30~40℃:≤50% |
| storage ENV | Temperature:-10~50℃ / Humidity:≤50% |
| Package | Color box/instruction manual/Solar test clip/tool kit<br>Multimeter probe |
| Power | 1500mAh rechargeable lithium battery (with protection circuit)<br>Charging with a charger of 5V/2A/10W or above<br>(not included as standard) |

*The above indicators are the best functional indicators
Test temperature: 23±2℃, humidity <70%