BLNK

Accessories Included in the Package:

Photovoltaic (PV) Panel Tester	× 1
Kelvin Clip Connection Cable	× 1
MC4 Connector Terminal	× 1
Optical Power Sensor	× 1
User Manual	× 1
Charging Cable	× 1

Safety Precautions:

When operating the instrument, avoid contact with exposed wires and connectors to prevent electric shock or short circuits.

Follow the correct operating procedures to avoid instrument damage or personal injury caused by incorrect operations.

During testing, check whether the positive and negative connections of the PV panel are correct to prevent short circuits or other safety issues.

Maintenance and Care:

Regularly clean the instrument housing and prevent liquids or foreign objects from entering the interior of the instrument.
This product comes with a one-year warranty service.。

We are committed to providing high-quality products and excellent services. We hope this PV panel testing instrument can meet your needs and provide you with an accurate, convenient, and reliable solution for your work.

PV panel and Solar Power tester

User Manual

MODEL : PVT801S

Manufacturer: Bo Ling Electronics Co., LTD
Address: Building 14, No. 107 Dongning Road, Jiangmen City, Guangdong Province

Must-Read Before Use

Thank you for using our company's series of products - "PV Panel + Solar Power Meter". Before installation and use, please carefully read this product manual and related application manuals.

- The use of this product must comply with relevant laws and regulations and be operated by qualified authorized personnel.
- Maintenance or repair of this product can only be performed by authorized personnel. Note that unauthorized repairs may affect the warranty.
- The data in this manual is subject to change without prior notice.

Product Purpose

1 Measure the maximum power output of PV panels. Under the same sunlight intensity, a higher maximum power point (MPPT) indicates better quality of the PV panel. By checking the shape of the IV/PV curve, you can determine whether there is damage to the PV panel module.
2 Determine the optimal power generation voltage of the PV panel to select a matching battery. The Vmax corresponding to the measured maximum power point is the optimal power generation voltage at the current moment.
3 Measure the sunlight power (light intensity), derive the light intensity and power generation curve model, and finally estimate the theoretical power generation of the PV panel under the standard light power of 1000 W/m² (theoretically close to the calibrated data provided by the PV panel manufacturer).

Simple Operation Guide for the Product

Step 1: Connect the positive and negative poles of the PV panel using the connection cable, connect the optical sensor, and keep the sensor level with the PV panel and facing the sun. (Note: The optical sensor must be kept level with the PV panel.)

Step 2: Clear historical data. Press the "Power On" button briefly once, wait for 1 second, and then press the "Power On" button briefly again to clear all historical data.

Step 3: Press the "Start Button" and wait for a few seconds to obtain a set of measurement data. After the conditions change, press the "Start Button" again and repeat the process multiple times to obtain multiple sets of data. The power generation data obtained at each moment is used to automatically calculate the power generation model. The larger the range of sunlight intensity variation, the more accurate the estimation result.

Step 4: View data (for the meaning of data, refer to Pages 3-5 of the manual):
Page 1: Displays core result data.
Page 2: Displays partial data of the PV panel power point from the last scan.
Page 3: Displays the VI and VP curves of the PV panel from the last scan.
Page 4: Records of the maximum power points of the PV panel from multiple measurements and the sunlight power at the time of measurement.
Page 5: Power generation model of sunlight power vs. power generation, and estimates the PV panel power under the standard 1000 W/m². (For first-time users, the charts on Page 3 and Page 5 can help you understand the instrument more quickly.)
Observe the sunlight intensity value and wait for changes in sunlight intensity (try to conduct measurements when sunlight intensity varies, such as when it is strong and weak).

Explanation of Measurement Data

Symbol	Name of Measured Value	Range	Accuracy	Explanation
Pmax	Maximum Power Value	0~800 W	0.5%	The maximum power generation of the PV panel under the current light intensity
Vmax	Voltage at MPPT Point	0~60 V	0.1%	The most suitable battery voltage under the current light intensity
Imax	Current at MPPT Point	0~35 A	0.1%	The power generation current under the current light intensity
Vopen	Open-Circuit Voltage	0~60 V	0.1%	The voltage of the PV panel when there is no load
Ishort	Short-Circuit Current	0~35 A	0.1%	The current generated when the positive and negative poles of the PV panel are short-circuited
Solar_Power	Sunlight Power	0~1000 W/m²	5%	Sunlight power (sunlight intensity value)
PV_STC_Pm	Estimated PV Panel Power	0~2000 W	5%	Estimated calibrated power of the PV panel. It is an estimated value, and there are many influencing factors, so the error is relatively large
Temperature	Internal Temperature	0~60 °C	3%	When an over-temperature alarm occurs, the instrument needs to be cooled naturally before use

Product Warranty Card

WARRANTY CARD

Repair	DateFault Condition	Handling Status	Repair Unit

Warranty Rules:

This product comes with a one-year overall warranty from the date of purchase.
Free repair is not provided in the following cases:
Damage caused by incorrect use or operation of the product.
Damage caused by repair, modification by others, or self-replacement of parts by the user.
Damage caused by water ingress or infiltration of other substances into the product.

Our company reserves the right to modify and interpret all contents.

Status Icons

1 Ready " " : The device is ready. Press the "Start Button" to begin testing.
2 Testing in Progress " " : The device is in the testing process, which takes approximately 2 seconds.
3 Just Completed Testing, Waiting for Cooling " " : The higher the power, the longer the waiting time.
4 Over-Temperature Alarm " " : The device is currently in over-temperature alarm. Please stop testing and allow the device to cool naturally before using it again; otherwise, the device may be damaged.

Manual Test Mode

Manual mode is used for low-power PV panels with power less than 100 W and for debugging some products. First, long press the start button to enter manual mode, then adjust the load power by pressing the "Up/Down Buttons" and stop pressing when the power reaches the maximum value. (Note: The power will first increase and then decrease; the maximum power is the value we need to measure.)
You can first long press the "Up Button" to increase the power, and when it is close to the maximum power value, adjust the power by short pressing the "Up/Down Buttons".
(In general, manual mode is not recommended; automatic mode is more accurate.)

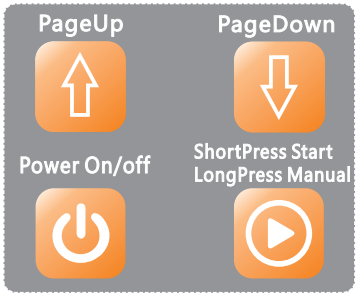
USB Data Export Method

Connect to a computer using a USB data cable (the cable included in the package is not supported). If the computer emits a sound prompt indicating a new hardware connection, it means the connection is normal. Then open the serial communication software (search for sscomv5.13.1 or other serial software online), select the newly appeared port (USB Serial Device), no need to configure the baud rate, etc., and then send any data to the instrument to receive a large amount of printed data returned by the instrument. The data can be copied for use.

Precautions

1, Do not use the instrument to measure PV panels with power exceeding 800 W; otherwise, the device may be burned out.
2, The PV panel under test must not be connected to other controllers or similar devices at the same time.
3, If the device gives an over-temperature alarm, it must be cooled naturally before continuing to use it.
4, The optical sensor needs to be well protected; it is better to close the sliding cover when not in use.
5, Testing must be conducted under sunlight, and it is necessary to measure the power generation under different sunlight intensities (when sunlight intensity changes).
6, During the testing process, the optical sensor must be kept level with the PV panel.

Key Operation Instructions



- **Previous Page / Next Page (Triggered by Short Press):** Can switch between upper and lower pages, or after unlocking in the settings interface, can modify parameter values.
- **Long Press "Previous Page":** Enter the settings interface. For specific methods of setting parameters, refer to the parameter setting page.
- **Long Press "Next Page":** Enter the help interface to view help and explanation information.
- **Power On - Power Off:** Short press to power on when the device is off; long press to power off when the device is on.
- **Clear All Data:** Short press the "Power Off" key once, wait for 1 second after the prompt appears, and then short press the "Power Off" key again to clear all historical measurement data.

Manual Test Mode

- **Short Press "Start":** Start one test.
- **Long Press "Start":** Enter manual test mode.

Explanation of Page 1

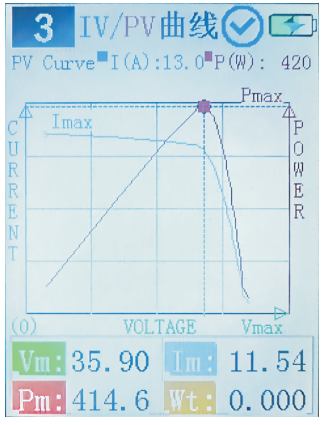
Page 1 (Core Data Display Page):
(These two items of data will be continuously measured and refreshed)
Open-Circuit Voltage: The no-load voltage of the current PV panel.
Sunlight Intensity: The sunlight power (light intensity) value detected by the current solar sensor.
Temperature: Displays the current temperature of the main chip inside the instrument; an alarm will be triggered if the temperature exceeds the threshold.

(These five items of data are recorded at the moment of measurement and will not change continuously)

Pmax: The maximum power generation of the PV panel from the last measurement.
Vmax: The voltage at the maximum power point of the PV panel from the last measurement.
(The most suitable voltage for power generation at this moment)
Imax: The current at the maximum power point of the PV panel from the last measurement.
Short-Circuit Current (Isc): The current generated by short-circuiting the positive and negative poles during the last measurement.
Instantaneous Light Intensity: The sunlight power (light intensity) at the moment of the last measurement.

Estimated Factory-Calibrated Power of the PV Panel: PV_STC_Pm: It is calculated based on the sunlight power - power generation data recorded from multiple measurements, by drawing a curve of power generation, and finally fitting a light intensity power generation model function. Then, the theoretical power that the PV panel should generate under the standard light power of 1000 W/m² is estimated. (This value requires multiple measurements under different sunlight conditions for calculation)

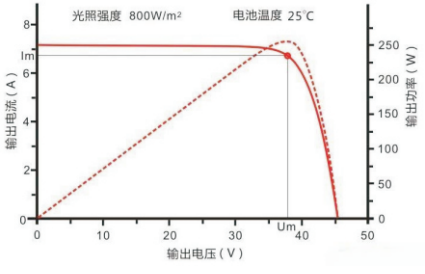
Explanation of Page 2 / Page 3



Page 2 - Partial Sampling
For the maximum power point from the last measurement, after automatically adjusting the load rate and scanning the PV panel once, there are approximately 300 data points. A portion of these data points are uniformly selected and displayed, and the data in red font represents the maximum power point.

Page 3 - IV/PV Curve
For the maximum power point from the last measurement, after automatically adjusting the load rate and scanning the PV panel once, there are approximately 300 data points, which are plotted to form a curve.

Example of a Normal PV Panel Curve Shape



In the curve data, the horizontal axis represents voltage; the blue curve represents current, and the red curve represents power. The marked point represents the maximum power point data, i.e., Vm, Im, and Pm are the values of the MPPT power point.
Wt: The amount of heat the instrument has absorbed during this measurement.

If the shape of the curve differs significantly from the left figure, it indicates that the PV panel is not generating power uniformly. This may be because some parts are not exposed to sunlight or there is damage to internal components.

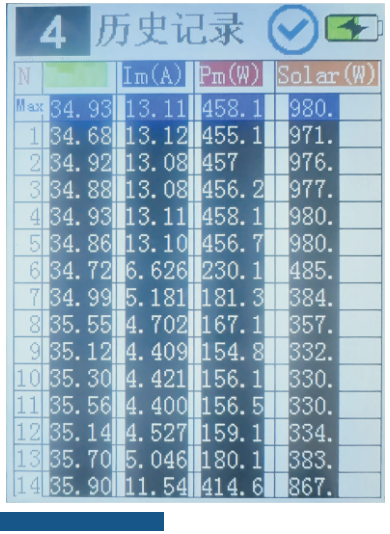
Explanation of Page 4

Page 4 - Historical Records
This page records data such as the maximum power point and sunlight power from multiple measurements (data at the moment of measurement), including Vm (voltage), Im (current), Pm (power), and Solar (sunlight power).

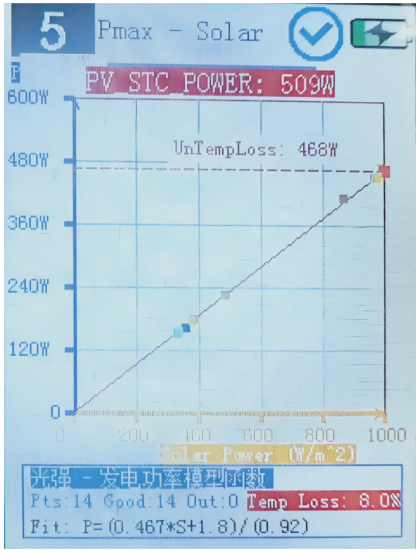
1 It can record a maximum of 14 sets of data.

2 "Max" indicates the highest power generation value among all data.

3 Data in red represents the latest measurement data.

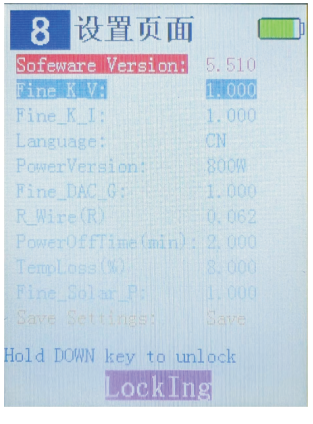


Explanation of Page 5



Page 5 - Solar Power / Power Generation and Power Generation Model Function
This page records data such as the maximum power point and sunlight power from multiple measurements (data at the moment of measurement) and plots them into a chart. The significance of this chart is that the PV panel generates different power outputs under different sunlight intensities, and a clear linear relationship between them can be observed from the chart.
Then, based on these data points, a power generation model function is fitted. According to the function model, the power generation of the PV panel when the sunlight power is 1000 W/m² can be estimated. In addition, it should be noted that the power generation of the PV panel will decrease when its temperature rises, usually by 6% - 12%, and we set a default compensation of 8%. After compensating for the temperature loss, the final estimated power (PV_STC_POWER) is obtained.
Example in the Chart:
Power generation model function: P=0.467×S+1.8
. When S=1000,P=468W, i.e., UnTempLoss: 509 W. This data does not include compensation for power loss caused by the increase in PV panel temperature. After we compensate for the temperature loss (Temp_Loss: 8%), the final result can be obtained as follows:
PV_STC_POWER=468/0.92=509 W。

设置页面 说明



Explanation of the Settings Page:

Parameter	Value	Explanation
Software Version	5.510	Software version number
Fine_K_V	1.0	Supports fine-tuning of voltage value; the result is multiplied by this coefficient
Fine_K_I	1.0	Supports fine-tuning of current value; the result is multiplied by this coefficient
Language	CN/EN	Language, supporting Chinese/English
PowerVersion	800 W	Power version (cannot be modified easily)
Fine_DAC_G	1.0	Scanning interval; the larger the value, the faster the scanning speed, the fewer the scanning points, and the worse the precision
R_Wire (R)	0.062	Wire resistance compensation value to ensure voltage accuracy
PowerOffTime (m)	2.00	Auto-power-off time, 2 minutes
TempLoss (%)	8.00	Power generation reduction of the PV panel due to temperature rise; generally, compensation ranges from 6% to 12%, which affects the estimated value
Fine_Solar_P	1.00	Supports fine-tuning of solar power measurement; the result is multiplied by

Instructions for Modifying Settings
Step 1: Long press the "Previous Page" button to enter the settings interface.
Step 2: Long press the "Next Page" button to unlock the settings protection.
Step 3: Use the Up/Down Buttons to select the item to be modified.
Step 4: Press the "Start" button to enter the item; the value will flash, and use the Up/Down Buttons to modify the value.
Step 5: Press the "Start" button to confirm the value.
Step 6: Use the Up/Down Buttons to move to "Save Settings", and press the "Start" button to confirm saving and exit.