



JONARD TOOLS®

MADE FOR LIFE™



SPM-800
SOLAR MPPT POWER METER
INSTRUCTION MANUAL

Preface

Thank you for purchasing this solar power meter. To use this product safely and correctly, it is recommended to read this User Manual thoroughly, especially the “Safety Information” section.


Overview

SPM-800 Solar MPPT Meter can measure the maximum power of a solar panel quickly. It measures maximum power (Pmax) of a solar panel, open-circuit voltage (Voc), and short-circuit current (Isc) simultaneously while displaying these measurements on screen. MPPT is the most important indicator for judging if a solar panel generates enough power in low efficiency settings and is commonly used for measuring solar panel power or troubleshooting faulty modules.

Key Features

1. No battery required. Powers on automatically when connected to a solar panel.
2. Manual/Auto modes
3. Overheating, overvoltage, and overcurrent protection
4. Protection against reverse connections
5. Overload protection

Carefully read the contents of the “Safety” and “Warning” sections included in this User Manual.

 **Warning:** Read the “Safety Information” carefully before use.

Accessories

Relevant safety information and warnings are included in this User Manual. Read the related contents thoroughly and follow all warnings and precautions. Contact your supplier if any accessory listed below is missing or damaged.




1. User Manual 1 pc
2. MC4 cables (UT-L101) 1 pair
3. Solar panel spanners 1 set

Safety Information

This meter is designed with double insulation with a maximum working voltage of 60 VDC. The protection supplied by the Meter may be compromised or lost without following the following operating instructions.

1. Check the Meter and test leads before use to avoid any damage to the meter or cause any problems.
2. Stop using the Meter if the test lead is exposed, the housing is damaged, there is an abnormal display, or if other problems occur during use.
3. Do not use the meter without the housing sealed. Otherwise, it may present a risk of electric shock.
4. If the test leads are damaged, replace it with the one with the same model or specification.
5. Do not touch the exposed wire, connector, unused input terminal or circuit during measurement.
6. Use caution when working with voltage over 30 VDC. Hold the test lead behind the guard to prevent electric shock.
7. Do not exert voltage over the specified value of the panel between terminals or between any terminal and earth ground.
8. Only use test leads (MC4 cables) with the same voltage and current ratings that are included with this meter.
9. Do not keep or use the Meter in environments with high temperature, high humidity, strong electromagnetic fields, or with flammable and explosive substances.
10. Do not alter the internal wiring without authorization to avoid damaging the Meter or causing safety hazards.
11. Measure a known intrinsic voltage or current before use to ensure the Meter works as expected.

Electrical Symbols

Symbol	Description
	Danger! High voltage!
	Warning
	DC (Direct Current)

General Characteristics

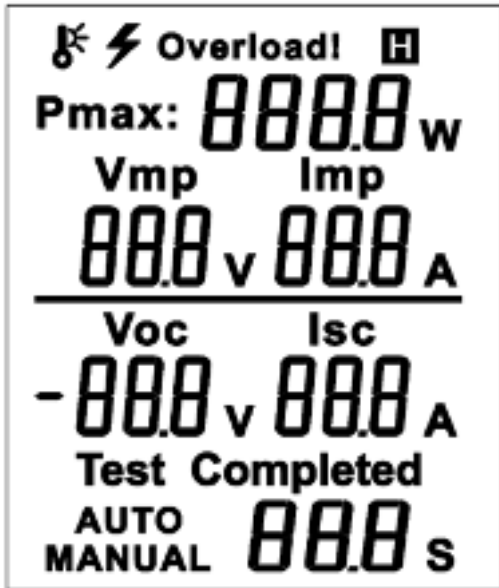
1. Maximum voltage between signal input terminal and COM terminal: 60VDC
2. Range: Auto/Manual
3. Polarity display: Protection against reverse connection
4. Overload indication: "OL"
5. Drop rating: 3 ft
6. Operating temperature: 18°C - 28°C (64°F - 82°F)
7. Storage temperature: -10°C - 50°C (14°F - 122°F)
8. Relative humidity: ≤75% (0°C - 30°C below); ≤50% (30°C - 40°C)
9. Operating altitude: ≤2000m
10. External dimensions: 142mm x 76mm x 22mm
11. Weight: ~ 154g
12. Measurement category: For solar panels only. Maximum Working Voltage: 60VDC
13. Pollution degree: 2
14. Application field: Solar panels

External Structure (Figure 1)

1. LCD/Display
2. Functional buttons
3. Hanging hook
4. Positive input terminal
5. Negative input terminal






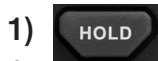
LCD Display



Symbol	Description
⚡ Overload!	Overload
H	Data hold
🔥	Overheating
Pmax:	Maximum displayed measured power: This is the maximum power that a solar panel generates while absorbing sunlight.
Vmp	Voltage of maximum power point: This is the maximum voltage while the solar panel is generating power.
Imp	Current of maximum power point: This is the maximum current while the solar panel is generating power.
Voc	Open-circuit voltage: The voltage without load
Isc	Short-circuit current: The current of shorted positive and negative poles of the solar panel
Test Completed	Test is completed
AUTO	Automatic test
MANUAL	Manual test
00.0 s	Countdown for the test to be completed

Functional Buttons

Button	Description
	HOLD: Data hold
	AUTO: Automatic test
	MANUAL: Manual test



- 1) 1.

In automatic sampling mode “AUTO”: When the current data is held, the Meter keeps counting down until 0.0s is reached, but sampling is not triggered. Sampling will proceed for 1s of countdown when HOLD is disabled.



- 2) 1.

Test starts 3s after the AUTO button is pressed. The Meter adjusts the test interval automatically based on the value of the current power and refreshes the display (refreshes once at intervals of 5s for $\leq 100\text{W}$; and 15s for $> 100\text{W}$).

2. To stop automatic testing, power on the Meter, then press the AUTO/MANUAL button when the first countdown of 15s is up. “Test Completed” will flash on the screen three times if the button is triggered within the set waiting time. The triggering of the AUTO/MANUAL button is enabled when pressed after the countdown is up.



- 3) 1.

Test starts 3s after the MANUAL button is pressed. The Meter starts scanning the maximum power point once and refreshes the display.

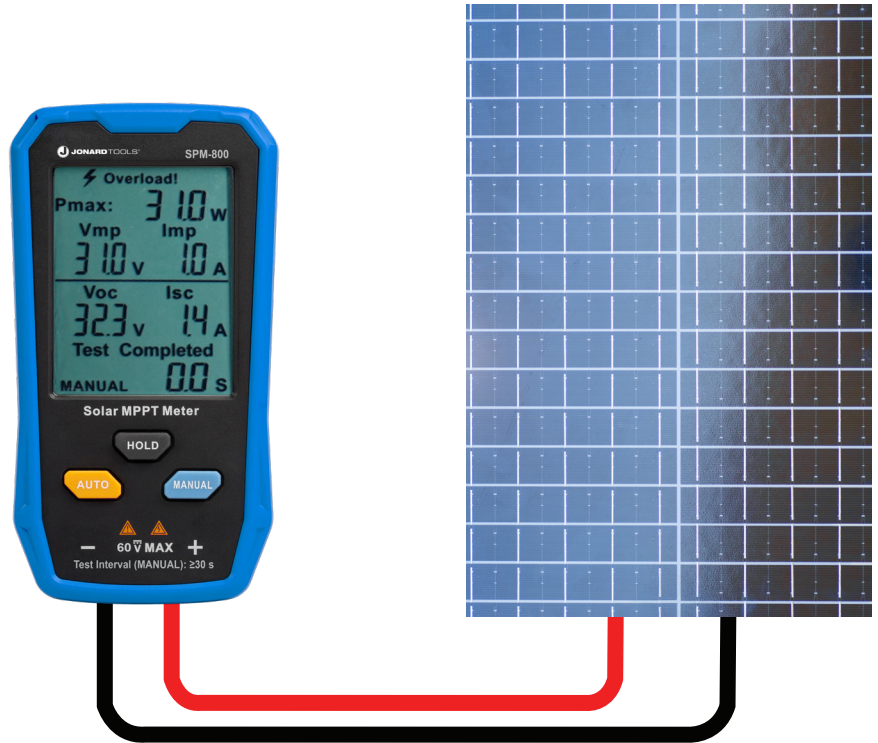
2. To avoid damage to the Meter caused by triggering the MANUAL button frequently, a sampling interval for protecting the Meter is built-in (the triggering of the MANUAL button is enabled when pressed at intervals of 5s for $\leq 100\text{W}$; and 15s for $> 100\text{W}$). “Test Completed” will flash on the screen three times if the AUTO/MANUAL button is triggered within the set waiting time. The triggering of the AUTO/MANUAL button is enabled when pressed after the countdown is up (the countdown is not displayed on the LCD).

Note: The triggering of the MANUAL button is disabled at the critical time “0.0s”, as the Meter has entered into sampling state.

Operating Instructions

The symbols “⚠️” near the input terminals indicate that the voltage under test shall not be over the specified value.

1. Connect the red test lead to the red (+) terminal, and connect the black test lead to the black (-) terminal. Then, connect the MC4 cable to the corresponding ports at both ends of the solar panel (connect to the load in parallel).
2. The value of Voc is displayed in real time when the Meter is powered on.
3. When the AUTO button is pressed for automatic testing, the Meter adjusts the test interval automatically based on the current displayed power.
4. Press the MANUAL button for manual testing. Test results can be obtained each time the MANUAL button is pressed.



⚠️ Warning:

1. Disconnect from the power grid for solar panel testing. The Meter does not test in the measurement category “CAT II or above”.
2. The Meter is used for solar panel tests only.
3. Do not measure voltage over 60 VDC or power over 800W, otherwise it may damage the Meter and cause personal injury.
4. If the symbol ⚠️ appears on the display, stop using until the Meter cools down.



Specifications

Accuracy: $\pm(a\%$ of reading + b digits); guaranteed for 1 year

Ambient temperature: $0^{\circ}\text{C}\sim 40^{\circ}\text{C}(32^{\circ}\text{F}\sim 104^{\circ}\text{F})$; relative temperature: $\leq 75\%$

Function	Range	Resolution	Accuracy $\pm(a\%$ of reading + b digits)	Input protection	Remark
Measuring open-circuit voltage (V)	12~60V	0.1V	$\pm(1.5\%+5)$	100Vrms	1)The Meter is powered by the solar panel and does not require a battery. The input voltage to the Meter should be $\geq 12\text{V}$. 2)DC voltage measurement serves as a power measurement, but the input amplitude should be between 12V and 60V. 3)The specified accuracy is calculated using a standard light source as the input.
Measuring power (W)	5~800W	0.1W	5~10W $\pm(1.0\%+5)$ 11W~500W $\pm(1.0\%+10)$ 501W~800W $\pm(1.5\%+5)$	If 100V is present, entering measurement mode will be limited and the symbol "OVERLOAD!" will appear on the LCD.	
Short-circuit current (A)	0~35A	0.1A	$\pm(1.5\%+5)$		

Warning:

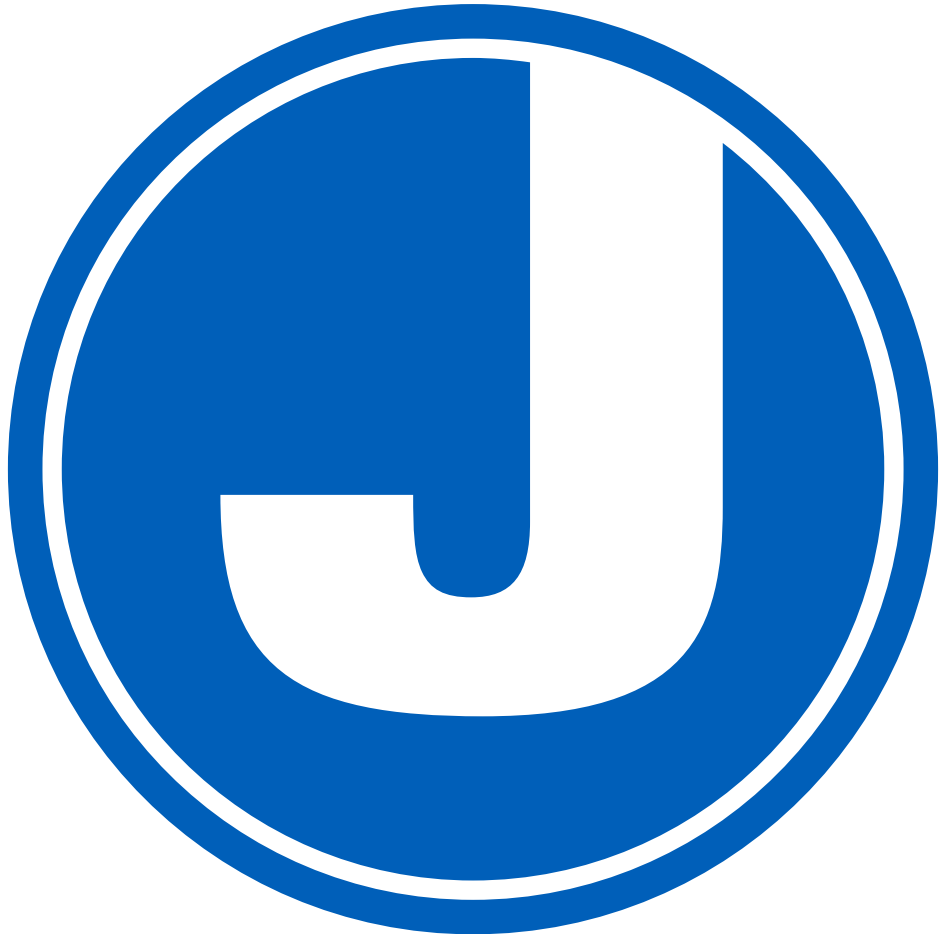
- The temperature should be between $18^{\circ}\text{C}\sim 28^{\circ}\text{C}$. The fluctuation range of ambient temperature stabilizes within $\pm 1^{\circ}\text{C}$. When the temperature is less than 18°C or greater than 28°C , the error of temperature coefficient added will be " $0.1 \times (\text{specified accuracy})/^{\circ}\text{C}$ ".
- The Meter powers off automatically within 10 minutes of inactivity. In the auto-off state, the Meter can be restarted by pressing any button.

Maintenance

Warning: Do not open the back of the housing to avoid damage to the Meter or personal injury.

General maintenance

- Clean the casing with wet cloth and mild detergent. Do not use abrasives or solvents.
- If there is any problem with the Meter, stop using it immediately.
- Calibration and maintenance must be performed by qualified professionals.



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