User Manual R1.0
Santacary Technology Co. Ltd.
XAR-S16 Solar Power Meter

INTRODUCTION

Congratulations on your purchase of this Santacary XAR-S16 Solar Power Meter. XAR-S16 is a portable precision instrument intended for outdoor solar radiation measurements of natural sunlight.

With this solar power meter, user can measure radiated and transmitted solar power at an installation to determine the optimum positioning and alignment of solar or PV panels. Verify window efficiency and performance by calculating the solar power reduction caused by direct sunlight.

FEATURES

- ✧ Wide spectral response
- ✧ Measure solar power and transmission up to 6000 W/m2, 1902 BTU / (ft2*h)
- ✧ Measure power per unit area of incident solar radiation
- ✧ Select either W/m2 or Btu / (ft2*h) units
- ✧ Hold function keeps a reading on the display
- ✧ Maximum or minimum reading displays the highest or lowest reading in a session
- ✧ User calibration factor setting function
- ✧ Easy to read large backlight display
- ✧ With temperature and humidity measurement
- ✧ Only two buttons and easy to operate
- ✧ Four AA Alkaline Batteries

APPLICATION

- ✧ Meteorology
- ✧ Agriculture
- ✧ Solar radiation measurement
- ✧ Solar power research for location of the solar panels or solar water heater

- ✧ Physics and optical laboratories
- ✧ Solar transmission measurement: calculate solar power transmission percentage of the material for example how much solar power in % will be transmitted through the window.
- ✧ Verify window efficiency and performance by calculating the solar power reduction caused by direct sunlight.

DEVICE

1. Solar power sensor
2. LCD display
3. Power button
4. Function button

OPERATING INSTRUCTIONS

1. **Turn on the meter**

While the meter is turned off, press Power button  shortly to turn on the meter. When the meter is first turned on, it performs 2 second countdown for meter stable. The meter starts taking measurements and updates solar power readings every 1 second. The unit of solar power is W/m^2 .

2. **Turn on the backlight**

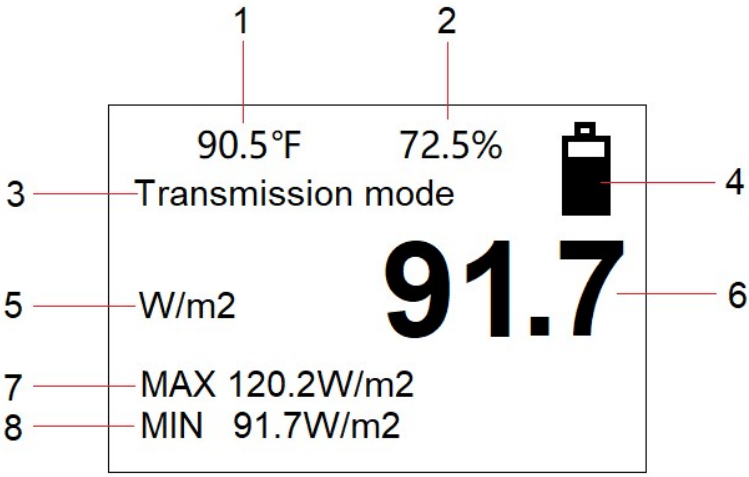
When LCD backlight is off, press any button to turn on the backlight. LCD backlight will turn off automatically after 2 minutes of inactivity.

Note:

- LCD backlight will turn off automatically after 2 minutes of inactivity.
- When LCD backlight is off, press any button to turn on the backlight.

3. **Normal measurement**

Place the meter so the sunlight falls squarely on the sensor on top of the meter. Read the solar power value from the LCD display. The maximum and minimum values are recorded during the measurement and updated in real time.

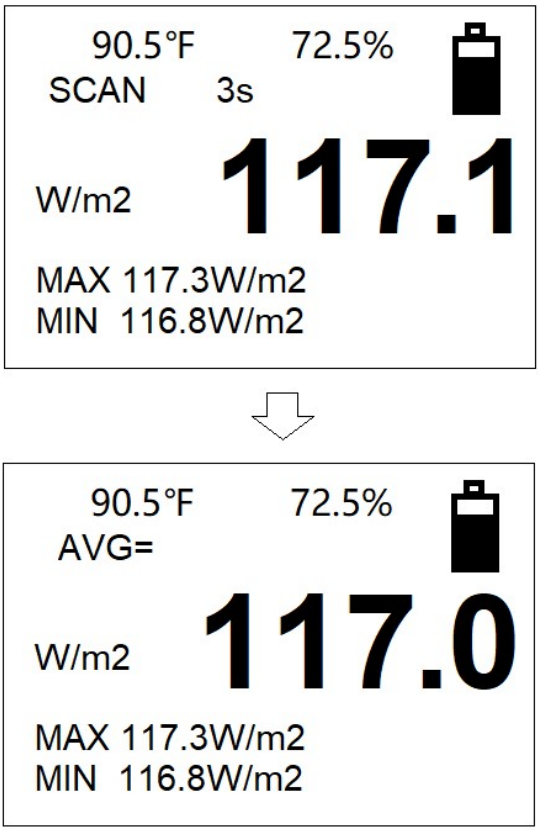


1. Temperature
2. Relative humidity
3. Status prompt
4. Battery gauge
5. Solar power unit
6. Solar power value
7. Maximum solar power
8. Minimum solar power

4. **Solar power average**

While the meter is displaying instantaneous solar power readings press Power button shortly, then keep the meter still or move the meter steadily and fluidly under the area for which you desire an average reading. The LCD will display “SCAN” prompt while the scanning is being implemented. Scanning can be done for up to 60 seconds or press power button shortly to end the scanning. Once ended, the LCD will display “AVG” prompt and the average solar power reading

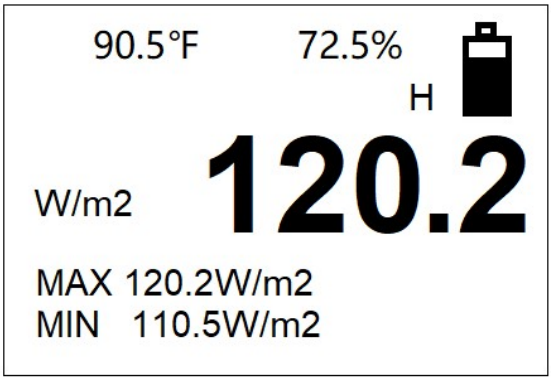
from the duration of the scan/stillness.



5. **Hold function**

Hold function keeps a reading on the display. In normal measurement state, press the Function button **FUNC** shortly to select Hold function. The solar power meter then stops all further measurements and the LCD will display “H” on screen up-right side. Press the power button ⏻ shortly to exit Hold function. It will resume normal operation. The maximum and minimum values of solar power before

Data-Hold operation is reset and cleared.



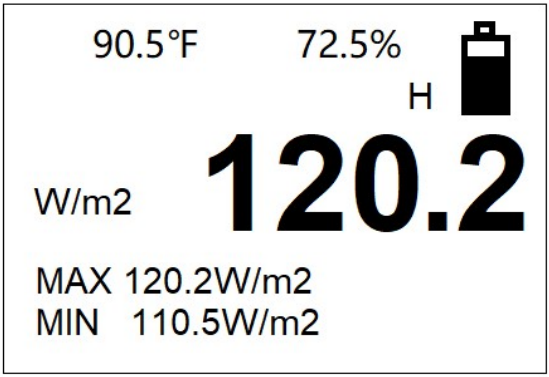
6. **Solar transmission measurement**

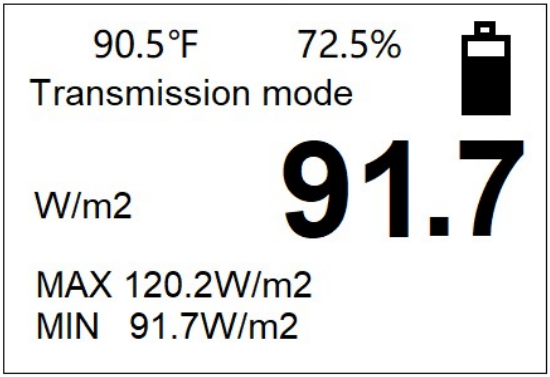
The meter can calculate solar power transmission percentage of the material for example how much solar power in % will be transmitted through the window. This measurement verifies window efficiency and performance by calculating the solar power reduction caused by direct sunlight.

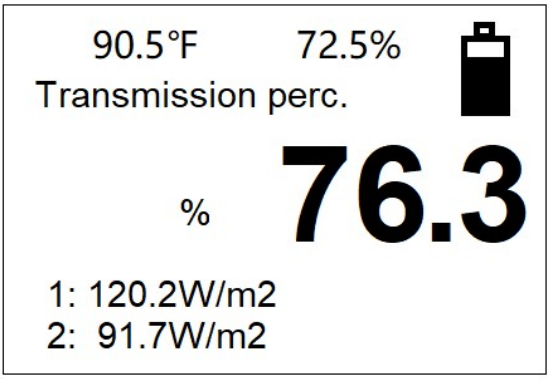
The operation processes for window example are described as follows.

1) In the sunlight, place the meter in front of the window to measure the first stable solar power value. Press the Function button **FUNC** shortly to hold the value. LCD will display “H” on screen up-right side.
2) Press the Function button **FUNC** shortly for the second time. LCD displays “Transmission mode” on screen up-left side. The display is real time value.
3) Place the meter behind the window to measure the second stable solar power value. Press Function button **FUNC** shortly for the third time to hold the second value. The solar power transmission percentage (%) is automatically calculated and displayed. LCD also displays “Transmission perc.” on screen up-left side.

4) Press Function button FUNC after step 3) or the power button ⏻ shortly in any of the above steps to end/ terminate the solar transmission measurement and return to the normal measurement state.


90.5°F
72.5%
H
W/m2
120.2
MAX 120.2W/m2
MIN 110.5W/m2

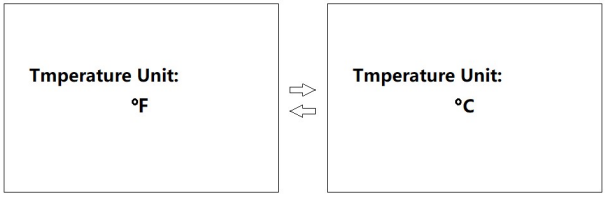
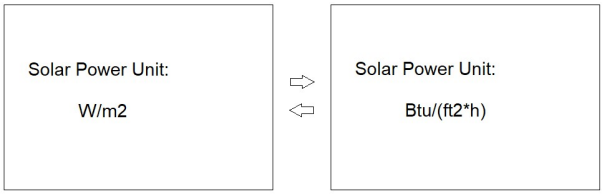

90.5°F
72.5%
Transmission mode
W/m2
91.7
MAX 120.2W/m2
MIN 91.7W/m2

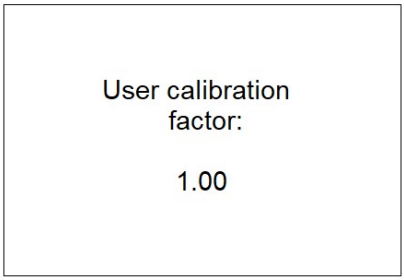

90.5°F
72.5%
Transmission perc.
%
76.3
1: 120.2W/m2
2: 91.7W/m2

7. **Menu operations**

By pressing the Function button **FUNC** for 3 seconds, the meter enters into Menu operation. There are five menu items by pressing the Function button **FUNC** shortly to loop. The menu items are described in table 1.

Table 1 Menu Operations

Menu Items	Description and Operation
Temperature Unit	1) Pressing power button ⏻ shortly to switch two temperature units: °F and °C.  2) Pressing the Function button **FUNC** shortly to confirm and enter next menu item.
Solar Power Unit	1) Pressing power button ⏻ shortly to switch two solar power units: W/m2 and Btu/(ft2*h).  2) Pressing the Function button **FUNC** shortly to confirm and enter next menu item.
Zero the sensor offset	1) Keep the sensor completely dark (such as covering the sensor with a black opaque

	object) 2) Pressing power button shortly to reset the sensor offset and exits the MENU operation. Return to the normal measurement state.
User calibration factor	Setting the user calibration factor value in the range of 0.50 to 2.00 for custom calibration. This factor will be automatically multiplied by the measurement result of meter. 1) User presses power button to increase value with one step of 0.02. When the factor reaches 2.00, its next value will loop back to 0.50.  2) Pressing the Function button **FUNC** shortly to confirm and enter next menu item.
EXIT	1) User presses power button to exit the MENU operation and return to the normal measurement state. 2) Or pressing the Function button **FUNC** shortly to lop back to the first menu item: Temperature Unit.

8. **Turn off the meter**

When the measurement is completed, press power button  for 2 seconds to turn off the meter.

SPECIFICATIONS

Solar Power Specification

Measuring Range	0 to 6,000 W/m2 or 0 to 1,902 Btu/ (ft2 x h)
Spectral Response	350 to 1100 nm
Accuracy	±10 W/m2 (±3 Btu / (ft2 x h)) or ±5% reading , whichever is greater in sunlight
Resolution	0.1 W/m2，0.1 Btu/(ft2 x h)
Drift	< ±2% per year
Calibration	User recalibration available
Sampling Rate	1 times/sec
Photo Detector	One silicon photo diode and spectral response filter

Temperature Specification

Temperature Range	-10°C to 50°C (14°F to 122°F) display
Display Resolution	0.1°C (0.1°F)
Display Options	°C/°F switchable
Accuracy	±0.5°C (±0.9°F)
Response Time	5~30 seconds (device must equilibrate with environment)

RH Specification

Measurement Range	0.0~99.9%RH
Display Resolution	1%RH

Accuracy	±4.5%RH
Response Time	<8 seconds for 63% of step change

General

Operating	-10°C to 50°C (14°F to 122°F), 0~90% RH non-condensing
Storage	-10°C to 60°C (14°F to 140°F), 0~80% RH non-condensing
Power Supply	Four AA Alkaline Batteries
Dimensions	75x165x25 mm (2.95x6.49x0.98”)
Weight	124 grams (4.37 oz.) without batteries

BATTERIES REPLACEMENT

1. When the batteries power is low, the low voltage symbol  appears on the display. It indicates that the batteries need to be replaced. If they are not replaced in time, the accuracy of measurement will be affected.
2. Open the battery compartment cover and take out the batteries.
3. Install 4 new AA batteries correctly according to the diagram of positive and negative poles in the battery compartment.
4. If the meter is not used for a long time, please take out the batteries to prevent the batteries from leaking and damaging the meter.

PACKAGE INCLUDED

- ✧ Santacary XAR-S16 Solar Power Meter
- ✧ Carry case
- ✧ English User Manual

CLEANING AND STORAGE

The front panel and case can be cleaned carefully with a soft wet cloth. Allow drying completely before using. Do not use aromatic hydrocarbons or chlorinated solvents for cleaning.
Do not store the instrument where temperature or humidity is excessively high.

WARRANTY

The XAR-S16 is warranted to be free from defects in material and workmanship for a period of two year from the date of purchase. This warranty covers normal operation and does not cover misuse, abuse, alteration, neglect, improper maintenance.

CONTACT US

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