TENMARS

Illumination -Solar -UVA 3 in 1 Light Meters

TM-208A

User Manual

CE

HB2TM208A003

Contents:

1 Application

Illumination -Solar -UVA 3 in 1 Light Meters

- UV-A meter applications include:
  1. UV Curing.
  2. Fly trap.
  3. UV-A Lamp Monitoring.
- Illumination meter can be used in all indoor or outdoor visible lighting measurements.
- Solar power meter applications include:
  1. Estimating PV array power output.
  2. Monitoring solar PV panel input.
  3. Measuring outdoor solar irradiance.

2 Accessories

1	Meter
1	User's Manual
1	USB cable
1	9V battery
1	Carrying case
1	AC to DC adaptor

3 Safety Precaution

⚠	Caution! Please refer to this manual. Improper use may damage the meter and its components.
CE	Comply with European Directive

- Do not operate in environments with flammable gas or humid environments.
- Operating altitude: up to 2000M.
- Operating environment: Indoor use; Pollution degree 2.

EMC: EN61326-1: CISPR 11: Group 1, Class B

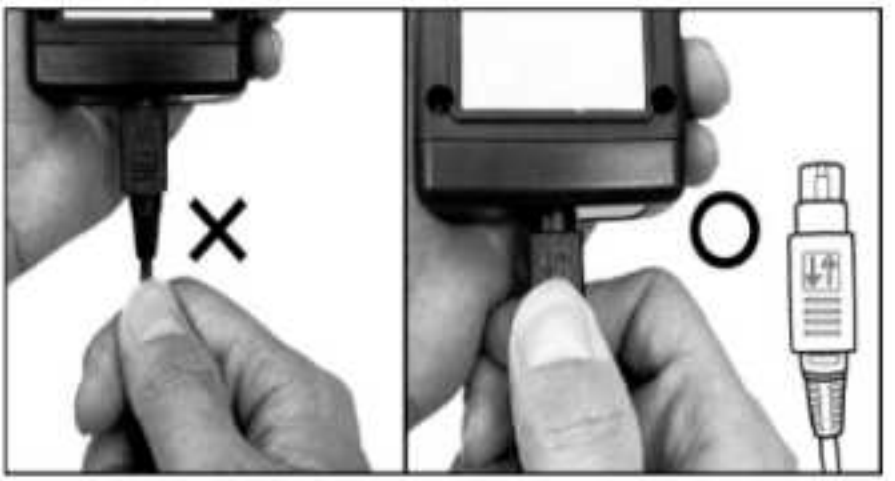
Class B – Equipment for use in all establishments other than domestic.

Group 1– RF energy generated is needed for internal functioning.

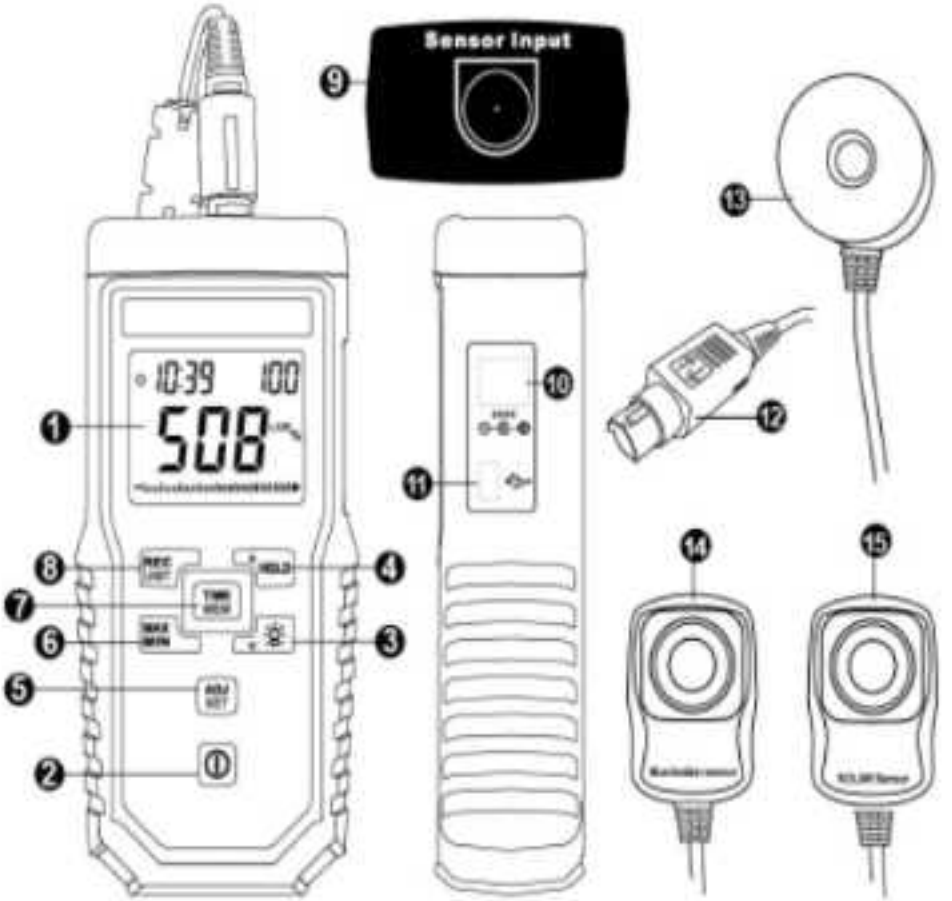
4 Instrument Description

4.1 Connector installs

The method of plugging and unplugging the connector is as shown below



4.2 Feature and Function



1.	LCD	9.	Sensor connecting jack
2.	Power Button	10.	External power DC 9V
3.	Backlight/Down Button	11.	USB interface
4.	Hold/Up Button	12.	Sensor connecting plug
5.	ADJ/SET Button	13.	UVA Sensor
6.	MAX/AVG/Min Button	14.	Illumination sensor
7.	Time/MEM button	15.	SOLAR Sensor
8.	Recode/ UNIT switch Button		

4.3 LCD Display

1. Numeral reading value
2. Time unit (hour: minute: month: second)
3. Memory reading symbol
4. AVG. symbol
5. W/m² /mw/cm² / uw/cm² unit.
6. Btu (ft²*h) unit.
7. Lux unit.
8. % unit
9. FC unit.
10. Adj symbol.
11. Low battery symbol.
12. Auto power off symbol.
13. MEM symbol.
14. Set symbol.
15. Analogue bar graph
16. Hold symbol
17. Max symbol
18. Min symbol
19. REC symbol

5 Operation

Press ⏻ button to turn on or turn off the power.

5.1 Unit Select

Hold " ⏻ " button and Press "REC UNIT" button to change the unit of **W/m² or Btu (ft²*h) / Lux or Fc.**

5.2 Data hold (HOLD)

Press HOLD to enable or disable the data hold function.

5.3 Zero Adjustment

- Press "ADJ SET" button and attach Cap on the sensor. 0.00 will appear on the LCD. Make sure that the cap is attached on the sensor.
- If the zero adjustment has not been made correctly, some digits will appear on the LCD instead of 0.00, and the word "Cap" will also appear on the LCD to inform you that the cap is covered completely on the sensor.

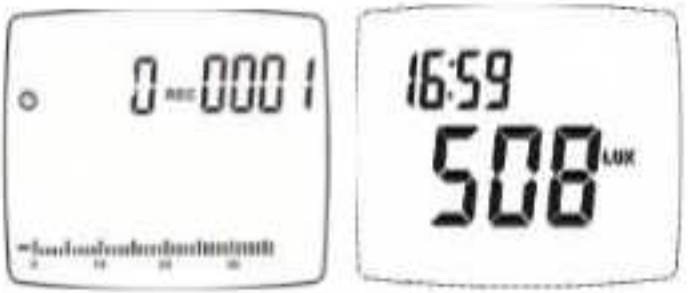
5.4 MAX/MIN/AVG hold:

Press "MAX MIN" to enable MAX /MIN/AVG function; again, press "MAX MIN" to show the MAX or MIN or average values by turns. Press and hold "MAX MIN" for more than 2 seconds to quit.
The measured data can be held and updated as the measured the MAX. and MIN. and average values.

- Follow the figure circles.

5.5 Manual Record

- Press "REC UNIT" button, the meter will save the current measured result, and REC will also appear on the LCD.



5.6 Manual Record Reading

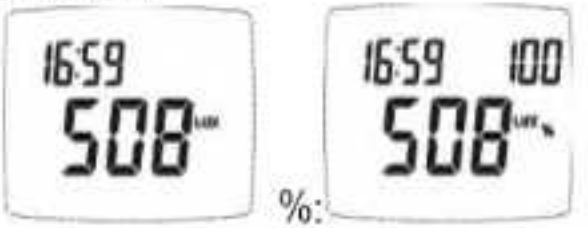
Hold " ⏻ " button and Press "TIME MEM"button "MEM" appears on the LCD · Press HOLD or 💡 to select the log number for reading, Hold " ⏻ " button and Press "TIME MEM"button to quit this mode.

5.7 Disable Auto Power Off

- Please hold " ⏻ " button and Press " 💡 " button, the auto power off symbol will not display on the LCD.
- If you want enable auto power off please hold " ⏻ " button and Press " 💡 " button again. The auto power off symbol will display on the LCD.
- Auto power off time is 30 minutes.

5.8 Relative Deduction Value (%)

- Hold "⏻" button and Press "MAX MIN" button into the setup mode to save the current measured result **(=100% transmission),** and then the current measured result will be divisor by the next measured result, and the diff erence from the divisor will appear RATE on the LCD.



- The transmission percent is= (second measured value/first measured value) x100
- Hold "⏻" button and Press "MAX MIN" button again to exit REL mode.

5.9 Clock LCD Display

Press TIME MEM button for more than seconds to select the display method of the Year, Month, Date, hour and Second.

This meter's clock uses 24-hour time setting.

Default time mode setting is "2010/01/07 00: 02" ":00".

5.10 Setup Mode

- Hold "⏻" button and Press "ADJ SET" button into the setup mode to use Auto Recording time setup or Time setup function.
- Hold "⏻" button and Press "TIME MEM" button to view records.
- Hold "⏻" button and Press "☼" button to disable Auto power off.

5.11 Turn on backlight

Press ☼ to turn the backlight on or off.

If connected via an external power supply, the backlight will light automatically and stay on.

- The backlight will automatically turn off after being lit for 30 seconds.

5.12 Auto Recording Time Setup

- Hold "⏻" button and Press "ADJ SET" button into the setup mode to change setup function.

- Press "ADJ SET" button again into Auto Recording Time Setup.
- Press "HOLD" or "☼" button to change digit
- Press "MAX MIN" or "REC UNIT" to select option to adjust
- Press "MAX MIN" button to skip from minute to hour and press "MAX MIN" button one more time, it will skip to second, and so far so on. (Min→Hour →Sec).
- Press "TIME MEM" button to store the setting.
- If you do not want to use auto power off, you can set auto power off time to be 00:00 00.
- Maximum auto recording time: 23 hours 59 minutes 59 seconds.
- Minimum auto recording time: 1 second.

5.13 Time clock Setup

- Hold "⏻" button and Press "ADJ SET" button to change time setup mode.

- This meter clock is 24-hour time setting.
- Press "HOLD" or "☼" button to change digit
- Press "MAX MIN" or "REC UNIT" to select option to adjust
- Press "MAX MIN" button to skip from hour to day, and day to month, and so far so on. (Hour→day→Month→year →Sec→Minute).

Hour: 

day: 

Month: 

Year: 

Sec: 

Minute: 

- Press "TIME MEM" button to store the setting.
- Years time 2000~2099: display 00 ~ 99

5.14 Viewing Records

- Hold "⏻" button and Press "TIME MEM" button to view records.

- Press "HOLD" or "☼" button to scroll through the records.

  Press "REC UNIT" to change (BTU (ft²*h) → W/m²→BTU (ft²*h)) / (FC→LUX→ FC)unit.

- Press "TIME MEM" button to change time data (H:M→M:D →year→ sec).

- Hold"⏻"button and Press"TIME MEM"button again to exit viewing records mode.

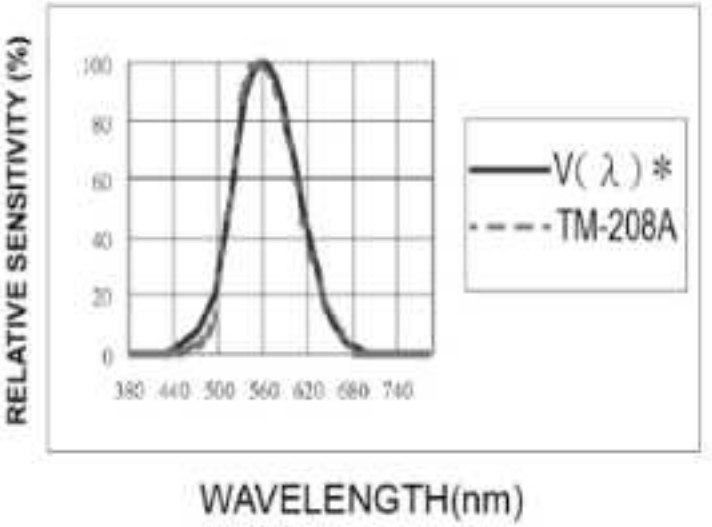
5.15 Measurement Instruction

The flux of light received in a unit area of a certain side being shone is popularly known as illumination. In both United Kingdom and United States, the unit is known as foot-candle light, but in Europe it is known as meter candlelight.

The unit is defined as the amount of illumination the inside surface an imaginary 1-foot radius sphere would be receiving if there were a uniform point source of one candela in the exact center of the sphere. Alternatively, it can be defined as the illumination on a 1-square foot surface of which there is a uniformly distributed flux of one lumen. This can be thought of as the amount of light that actually falls on a given surface. The foot-candle is equal to one lumen per square foot. Its abbreviated form is written as 1 Fc=1 Lm/ft, similarly, one-meter candlelight is the illumination of light that falls on a side that lies in a distance one meter away from a one-meter candlelight and exactly intersects the light. It is also called Lux i.e. the flux of light being received in each sq. meter is called the illumination of one lumen.

As 1 candle=10.764 Lux.

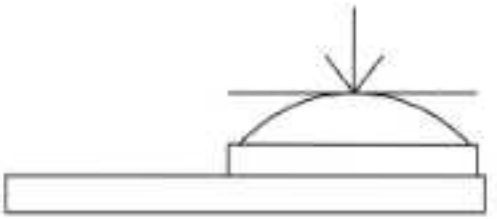
Relative Spectral (SENSITIVITY)



NOTE 1. :

- Set for referring the testing of source of light is located at the right top end (0 degree) of the light sensor ball plane.
- When the meter is not in use, please keep the cap of the light sensor in its place to avoid the photo diode from wearing out.

Light Source 0 degree



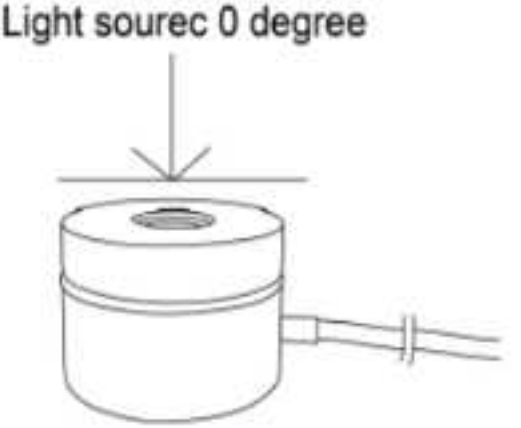
NOTE 2. :

Light Source Luminous Intensity (cd) calculated if a single light source is used and is regarded as a single-point light source, the luminous intensity of the light source can be calculated and displayed, by setting the distance from the light source to the measuring point.

Luminous intensity (cd) = illuminance (Lux) x distance $(m)^2$

Note3.

For UV measurement, please place it directly above the light receiving part (0 degrees)



6 Software Installation

1. Link website https://www.tenmars.com/ or scan below QR code:
2. Search for TM-208A.
3. Click on the TM-208A image.
4. Click on "**File Download**" and then select "**Software Download**".
5. Download and unzip the software.
6. For the latest software information and installation instructions, please download **the software installation guide**.

7 General Specifications

- Display: 3 ¾LCD display with back light maximum display 4000.
- Sampling: 4 times/second.
- Auto power off and disable auto power off.
- Enable and disable auto power off function (default 30 minutes).
- Low battery indication "".
- Battery life: approx. 100 hr.
- Over load display "OL".
- Maximum and Minimum hold
- Auto zero adjustment.
- Data Interface: USB.
- Datalogging capacity up to 45,000 reading.
- Power: 9V Alkaline battery.
- Dimension: 143(L) x 67(W) x 38 (H)mm.
- Weight: approx.250g. (No batteries included)
- Operating temperature and R.H. value: 5°C to 40°C,80%RH.
- Storage temperature and R.H. value: -10°C to 60°C, 70%RH.
- Sensor length:1.0M.
- **AC to DC Adaptor**
  External AC 100~240V to DC 9V/0.5A power supply
  Diameter: 5.5mm; internal diameter: 2.1mm

8 Electrical Specifications

Accuracy is indicated as [% reading + digital]
Environmental conditions at 23°C ± 5°C with RH < 80%

8.1 UVA Electrical Specification

Measuring range	Resolution	Accuracy (25°C)
400.0 μw/cm²	0. 1	± (4%FS + 2dgt) **FS: full scale**
4000 μw/cm²	1	
20 .00 mw/cm²	0.01	

- Wavelength: 320 - 390 nm.
- Peak sensitivity wavelength: 365 nm.
- Sensor: The exclusive photo diode & UVA color correction filter

8.2 Solar Power Electrical Specification

Measuring range	Resolution	Accuracy (25°C)
40.00 W/m²	0.01	± 10W/m² or ±5%
400.0 W/m²	0.1	
2000 W/m²	1	
13.00 BTU /(ft² · h)	0.01	3 BTU /(ft² · h) or ±5%
127.0 BTU/(ft² · h)	0.1	
634 BTU /(ft² · h)	1	

- whichever is greater in sunlight; Additional temperature induced error ±0.38W/m² / °C [±0.12 BTU / (ft² · h)/ °C] from 25°C
- Peak sensitivity wavelength: 400 - 1100 nm.

8.3 Illumination Electrical Specification

Sensor	Silicon photodiode and filter	
Measuring Range	40.00,400.0 ,4000, 40000,400000 Lux 40,400,4000,40000 Foot-candles	
Resolution	0.01, 0.1, 1, 10, 100 Lux 0.01, 0.1, 1, 10 Foot-candles	
Accuracy	±3% (Calibrated to standard incandescent lamp 2856° K) 6% other visible light source	
Angle deviation from cosine characteristics	30°	±2%
	60°	±6%
	80°	±25%

- Peak sensitivity wavelength：380 - 780 nm.
- Cosine angular corrected.
- According to JIS C 1609:1993 and CNS 5119 general A class Specifications.
- Peak sensitivity wavelength:550nm

9 Maintenance and Repair

1. When the When "  " symbol is displayed on the LCD, it means that there is insufficient power; please change the battery immediately in order to ensure its accuracy.
2. Do not place the meter in locations that have high temperature, humidity or that are exposed to direct sunlight.
3. Remember to turn off the power after usage; remove the battery if not used for a long period of time in order to prevent battery leakage and causing damages to internal components.
4. When the instrument failure, only by the authorized service provider or return the original repair.

10 Battery Replacement

	Caution
⚠	If the LCD displays "🔋", please replace the battery immediately and follow the procedures below.

- Turn off the power.
- Open the battery cover on the back of the meter and remove the batteries.
- Please insert new 9V batteries according to the polarities.
- Close the battery cover.

11 Product Disposal

Note: This symbol indicates that the meter and its accessories must be separated and processed properly.

TENMARS
泰瑪斯

Professional Electrical and Environment Test & Measurement Instruments

Battery Impedance, Capacity Tester, Tachometer, LED light meter, Temperature & Humidity meter, Infrared Thermometer, Sound Level Meter, Light meter, EMF meter, UV Light meter, Hot wire Anemometer, Anemometer, Lan cable tester, Co meter, Co2 meter, Solar Power Meter, Radiation meter, Clamp meter, Multimeter, Phase Rotation test, Digital Insulation tester

Our products of high quality are selling well all over the world

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