

TENMARS

Illumination -Solar -UVA

3 in 1 Light Meters

TM-208A

User's Manual



HB2TM208A002

Content:

1.	Introduction.....	1
2.	Accessories.....	1
3.	Specifications.....	2
3.1.	General Specifications	2
3.2.	UVA Electrical Specification	3
3.3.	Solar Power Electrical Specification.....	4
3.4.	Illumination Electrical Specification	5
4.	Safety Precaution:.....	6
5.	Illumination Instruction.....	6
6.	Instrument description	9
7.	LCD description	10
8.	Operation.....	11
9.	Software installation.....	22
10.	Maintenance or Repair.....	25
11.	PRECAUTIONS.....	25
12.	Battery Replacement	26
13.	Product Disposal:	26

1. Introduction


- Illumination -Solar -UVA 3 in 1 Light Meters
- UV-A meter applications include:
 - The complete source for all your UV curing needs.
 - UV Curing.
 - Fly trap.
 - UV-A Lamp Monitoring.
 - Illumination meter can be used in all indoor or outdoor visible lighting measurements.
 - Solar power meter applications include:
 - Estimating PV array power output.
 - Monitoring solar PV panel input.
 - Measuring outdoor solar irradiance.

2. Accessories

- 1 Meter
- 1 User's Manual
- 3 Illumination and Solar and UVA sensor each one.
- 1 9V battery
- 1 Carrying case
- 1 USB cable and Installation disk
- 1 AC to DC adaptor

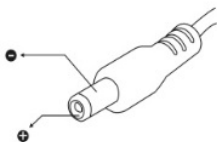
3. Specifications

3.1. General Specifications

- Battery life: approx. 100 hr.
- Display: 3 3/4 LCD 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 “”.
- Over load display “OL”.
- Maximum/Minimum/Average record and elapse time.
- Auto zero adjustment.
- Data Output: USB PC serial interface.
- Datalogging capacity up to 45,000 reading.
- Power: 9V battery、NEDA 1604、IEC 6F22 or JIS 006P.
- Size: 130(L) x 56(W) x 38 (H)mm.
- Weight: approx.250g.
- Consumption Current: $\leq 10\text{mA}$.
- Sensor length:1.0M.
- **AC to DC Adaptor**
External AC 100~240V to DC 9V/0.5A power supply

Plug: The pin in the center connects to the positive electrode and the outer case is negative electrode

Diameter: 5.5mm; internal diameter: 2.1mm



3.2. UVA Electrical Specification

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

Measuring range	Resolution	Accuracy (25°C)
400.0 $\mu\text{w}/\text{cm}^2$	0.01	$\pm 4(\%FS + 2\text{dgt})$ / $< \pm 3/\text{year}$
4000 $\mu\text{w}/\text{cm}^2$	1	
20 .00 mw/cm^2	0.01	FS: full scale

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

3.3. Solar Power Electrical Specification

Accuracy is indicated as [% reading + digital] Environmental conditions at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ with $\text{RH} < 80\%$.

Measuring range	Resolution	Accuracy (25°C)
40.00 W/m^2	0.01	$\pm 10\text{W}/\text{m}^2$ or $\pm 5\%$
400.0 W/m^2	0.1	
2000 W/m^2	1	
13.00 $\text{BTU}/(\text{ft}^2\cdot\text{h})$	0.01	3 $\text{BTU}/(\text{ft}^2\cdot\text{h})$ or $\pm 5\%$
127.0 $\text{BTU}/(\text{ft}^2\cdot\text{h})$	0.1	
634 $\text{BTU}/(\text{ft}^2\cdot\text{h})$	1	

whichever is greater in sunlight; Additional temperature induced error $\pm 0.38\text{W}/\text{m}^2 / ^{\circ}\text{C}$ [$\pm 0.12 \text{ BTU} / (\text{ft}^2\cdot\text{h}) / ^{\circ}\text{C}$] from 25°C

- Peak sensitivity wavelength: 400 - 1100 nm.

3.4. Illumination Electrical Specification



Accuracy is indicated as [% reading + digital]

Environmental conditions at 23°C ± 5°C with RH < 80%

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

4. Safety Precaution:

	Caution! Please refer to this manual. Improper use may damage the meter and its components.
	Complies 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.
- Clean with soft cloth when dirty, such as glasses cloth. Do not clean with chemicals and other solvents.
- 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.

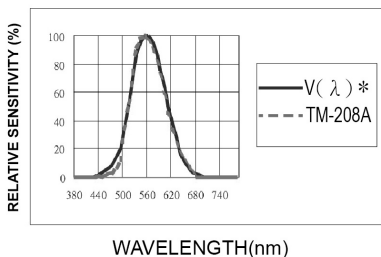
5. Illumination Instruction

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 $1 \text{ Fc}=1 \text{ Lm/ft}$, 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 $1 \text{ candle}=10.764 \text{ Lux}$.

Relative Spectral (SENSITIVITY)



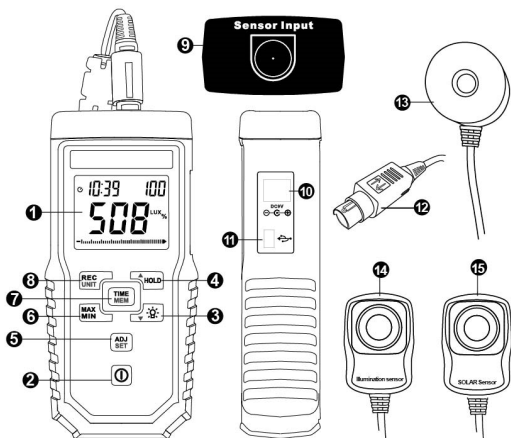
NOTE 1. : When the light sensor cap is not attached on the sensor, the word “CAP” will appear on the LCD. Make sure that the cap is attached on the sensor. If the zero adjustment has not been made correctly, some digits will still appear on the LCD instead of 0.00. In this case, please make the zero adjustment again.

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

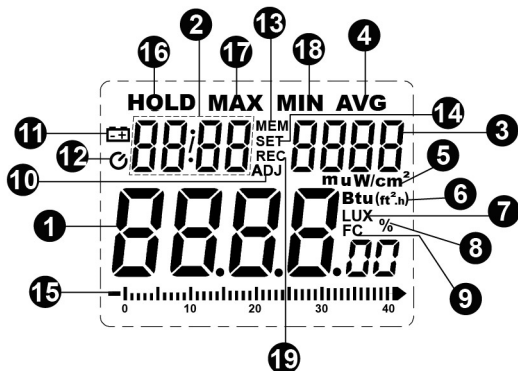
Set the distance to the measuring light source in advance.

6. Instrument description




- | | |
|-------------------------------|----------------------------|
| 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 | |

7. LCD description





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

8. Operation


Press  button to turn on or turn off the power.

8.1. Unit Select


Hold “  ” button and Press “  ” button to change the unit of **W/m²** or **Btu (ft²*h) /**

Lux or Fc.




8.2. Data hold (HOLD)

Press  to enable or disable the data hold function.

8.3. Zero Adjustment

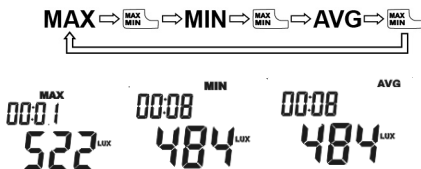
- Press “  ” button and attach Cap on the sensor. 0.00 will appear on the LCD. Make sure that the cap is attached on the sensor.
- If the zero adjustment has not been made correctly, some digits will appear on the LCD instead of 0.00, and the word “Cap” will also appear on the LCD to inform you that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

8.4. MAX/MIN/AVG hold:


Press “” to enable MAX /MIN/AVG function; again, press “” to show the MAX or MIN or average values by turns. Press and hold “” for more than 2 seconds to quit.

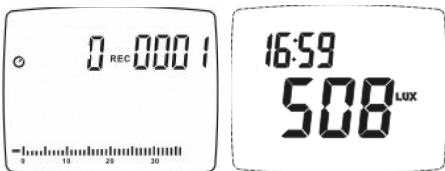
The measured data can be held and updated as the measured the MAX. and MIN. and average values.

- Follow the figure circles.









8.5. Manual Record

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



8.6. Manual Record Reading

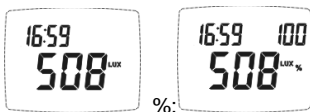
Hold “” button and Press “” button “MEM” appears on the LCD , Press  or  to select the log number for reading, Hold “” button and Press “” button to quit this mode.



8.7. 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.


8.8. 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 difference from the divisor will appear RATE on the LCD.



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

8.9. Clock LCD Display







Press  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”.



8.10. Setup Mode

- Hold “” button and Press “” button into the setup mode to use Auto Recording time setup or Time setup function.
- Hold “” button and Press “” button to view records.
- Hold “” button and Press “” button to disable Auto power off.

8.11. 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.

8.12. 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.



Min:

- Press “▲ HOLD” or “▼ :Q:” 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 “” 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.


8.13. Time clock Setup

- Hold “” button and Press “” button to change time setup mode.





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






- Press “” button to store the setting.
- Years time 2000~2099: display 00 ~ 99



8.14. Viewing Records

- Hold “” button and Press “” button to view records.




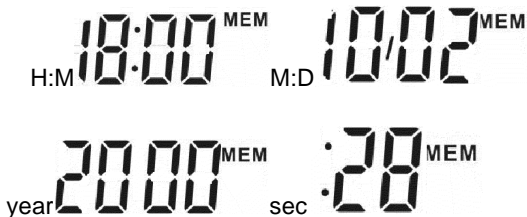
- Press “” or “” button to scroll through the records.



Press “” to change (BTU (ft²*h) → W/m² → BTU (ft²*h)) / (FC → LUX → FC) unit.

W/m²:  

Lux:  Fc: 

- Press “” button to change time data (H:M→ M:D→year→ sec).



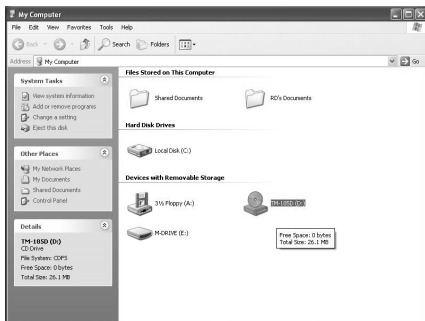
- Hold “” button and Press “” button again to exit viewing records mode.

8.15. Computer Grade

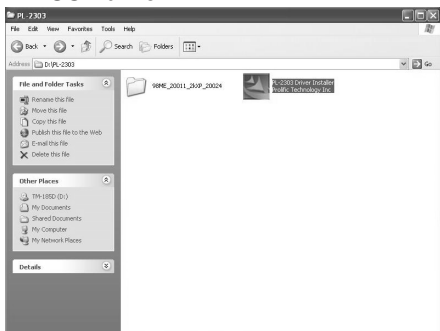
- CPU : Pentium III 1000MHZ.
- RAM : SDRAM 256MB.
- Hard Disk : 200MB.
- OS : XP/Windows7/Windows 8.1/Windows10.
- Display: 800x600 256 cooler.

9. Software installation

- Please insert the CD into PC to install the software.



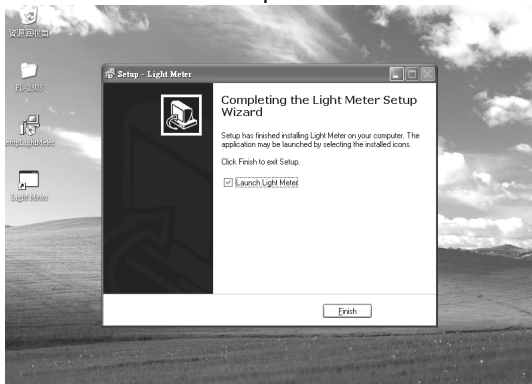
- Please select the USB driver that will be installed, such as E:\ Light Meter Driver Setup.exe, click twice on the left key of the mouse to install the USB driver.



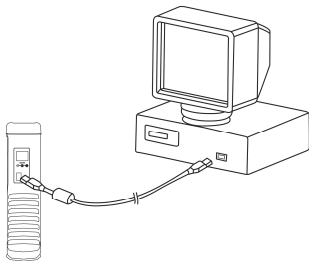
- Select the SETUP.EXE i.e., E:\Light Metre\SETUP.EXE and installs the desktop icon



Tack out the CD from PC after completed the installation of the desktop icon.



- Use the USB cable to connect the meter and computer according to the drawing.



- Select the desktop icon (Light Meter) and click twice on left key of the mouse to run the procedure.

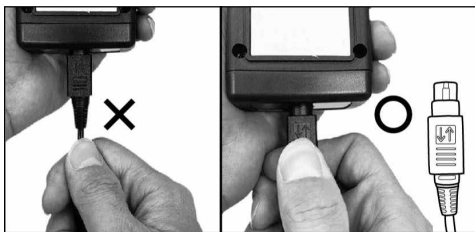


10. Maintenance or Repair

1. When the "⚡" 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.

11. PRECAUTIONS


Removing Probe (With LOCK) :



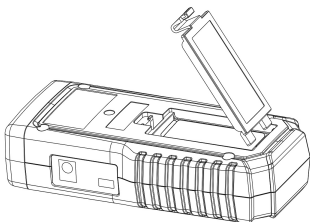
12. Battery Replacement



WARNING

If the LCD display “” symbol, please replace the battery immediately.

1. Turn off the power.
2. Open the battery cover at the back of the meter, remove the batteries.
3. Please insert new 9V batteries according to the polarities.
4. Put the battery cover back in place.



13. Product Disposal:



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

TENMARS



Professional Electrical and Environment Test & Measurement Instruments:

Battery Capacity / Impedance Tester, TACHO Meter, LED light meter, Temperature & Humidity meter, Infrared Thermometer, Sound level meter, Light meter, EMF meter, UV Light meter, RF meter, Hot wire Anemometer, CO meter Anemometer, Lan cable tester, 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**

TENMARS ELECTRONICS CO., LTD
6F, 586, RUI GUANG ROAD, NEIHU,
TAIPEI 114, TAIWAN.

E-mail: service@tenmars.com
<http://www.tenmars.com>