TENMARS

Precision Illumination -Solar -UVA 3 in 1-Meters

TM-208

User's Manual

CE

HB2TM2080003

Content:

1 Preface

Thank you for purchasing our product. Please, read the operating instructions in details before you use this optics meter, so you will operate the meter correctly. This meter can be used in industry and home.

2 Characteristics

- It gives the selection of Illumination –Solar. -UVA of one's own accord unit.
- Illumination -Solar –UVA.
- Convenient, no need to adjust, data displayed clearly.
- Real time data.
- Data hold function.
- Auto ranging.
- Back light.
- Auto power off and disable auto power off.
- USB PC interface.
- Data logging capacity up to 45,000 reading.
- Data logging of Illumination –Solar. -UVA of one's reading.
- Low battery indication"📧".
- Over load display "OL".
- Maximum/Minimum/Average record and elapse time.
- Auto zero adjustment.

3 Specifications

3.1 General Specifications

- Battery life: approx. 100 hr.
- Display: 3 3/4 LCD display maximum display 4000.Illumination -Solar -UVA of one's own accord unit BTU (ft2*h) / W/m^2 / uW/cm^2/ mW/cm^2 Lux /foot candles (fc) unit.
- Sampling: 4 times/second.
- Power off: Manual off by push button, or auto shut off after 30 minutes approximately.
- Data Output: USB PC serial interface.
- Datalogging capacity up to 45,000 reading.
- Power: 9V battery、 NEDA 1604、IEC 6F22 or JIS 006P(Only data logger use), or AC to DC Adapter. (9V/300mA).
- Size: 130(L) x 56(W) x 38 (H)mm.
- Weight: approx.250g.
- Consumption Current: ≦10mA.
- Standard Accessories: User's manual, 9V battery，Carrying case, MINI USB 4P(MALE) to USB A Type cable, Install CD disk of TM-208 AC to DC 9V(300mA) If you want to change sensor，you must turn the meter off first.
- Sensor length:1.0M.

EMC

- This tester was designed in accordance with EMC Standards in force and its compatibility has been tested in accordance with EN61326-1 (2006).

3.2 UVA Electric Electrical Specification

- Range   : 400.0µw/cm^2, 400µw/cm^2,

  4000µw/cm^2, 20mW/cm^2.

- Resolution   :

  0.1µw/cm2,1µ/cm^2,0.01mW/cm^2.

- Accuracy   : ± 4(%FS + 2dgt) FS: full

  scale/< ±3/year

- Wavelength : 320 - 390 nm.

- Peak sensitivity wavelength: 365 nm.

- Sensor   : The exclusive photo diode &

  UVA color correction filter

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3.3 Solar Power Electric Specification

- Range : 40.00w/m²m2,400.0w/ m²,4000w/ m², 2000W/m²/13 Btu(ft2 · h),127Btu(ft2 · h),634 Btu(ft2 · h).

- Resolution : 0.01 w/ m², 0.1 w/ m², 1W/ m²/ 0.01 Btu(ft2 · h),0.1 Btu(ft2 · h),1 Btu(ft2 · h).

- Accuracy：Typically within ± 10W/m2 [±3 BTU / (ft2*h)] or ±5% , 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.

- Auto Measurement & ranges : 0.01W/ m² ~2000W/m2、0.01 BTU /(ft 2 * h)~634 BTU /(ft 2 * h). °C.

3.4 Illumination Electric Specification

Sensor	Silicon photodiode and filter	
Measuring Range	40.00,400.0,400,4000, 40000,400000 Lux 40,400,4000,40000 Footcandles	
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.
- Measuring lights source include all visible.
- Many applications include: Warehouses, factories, office buildings, restaurants, schools, library, hospitals, photographic, many video, parking garages, museums, art galleries, stadiums, building security.
- Peak sensitivity wavelength:550nm

4   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 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 one foot candle=10.764 Lux, therefore,Nbr. of foot (meter) candlelight =Nbr. of Lumen

———————————————

Area(sq. foot or sq. meter)
Nbr. of Lumen=Nbr. of foot (or meter)x area
Foot-candle/Lux conversion
1 foot-candle=10.764 lux

1 lux=0.09290 foot-candles
(sq, foot or sq. meter)

Relative Spectral (SENSITIVITY)

The deviation from the comparative standards for

luminosity is determined by JIS standard C

1609-1993.

Typ. Ta=23°C

WAVELENGTH (nm)
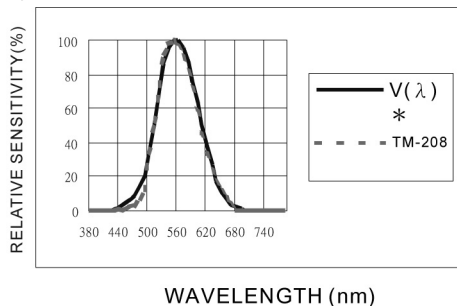
NOTE 1. : When the light sensor cap is not

attached on the sensor, the word "CAP" will

appear on the LCD. Make sure that the cap is

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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.

5   Instrument description

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

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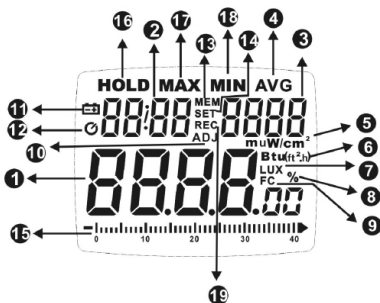
1. Numeral reading value
2. Time unit (hour: minute: month: second)
3. Memory reading symbol
4. AVG. symbol
5. W/m² /mw/cm² / uw/cm² unit.
6. Btu (ft²*h) unit.
7. Lux unit.
8. % unit.
9. Fc unit.
10. Adj symbol.
11. Low battery symbol.
12. Auto power off symbol.
13. MEM symbol.
14. Set symbol.
15. Analogue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

7 Measurement Procedures

■ Push " ⓞ " button turn on the meter, push
  " ⓞ "button again to turn off the meter.

■ Hold " ⓞ " button and push " REC/UNIT "button to
  change the unit.(Transform measuring unit
  w/m2) display data.

W/m² >> Btu (ft²*h)>> W/m² / Lux>> Fc >>Lux

W/m²: 10.00 W/m²   Btu(ft²*h): 10.80 Btu(ft²h)

Lux: 18.88 LUX   Fc: 10.80 FC

■ Push " HOLD/▲ " button to lock display data on the
  LCD，push " HOLD/▲ " button again to unlock.

HOLD:

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8   Zero Adjustment

■   Push "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.

ADJ/CAP:
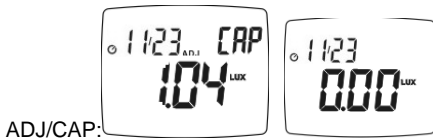
9   MAX/MIN/AVG Record:

■ Press "🔘" key to show the current MAX,
    MIN, and AVG values.

■ Press "🔘" key to switch to the next display.
    The display switches from MAX to MIN, MIN
    to AVG, and AVG to MIN. Follow the figure
    circles.

MAX ⇨ 🔘 ⇨ **MIN** ⇨ 🔘 ⇨ **AVG** ⇨ 🔘

■ Press and hold "🔘"key to disable this
    function.

■ The maximum storage is up to 99 minutes
    and 99seconds.

■ Press and hold "🔘" button for more than 2
    seconds to exit this mode.

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10 Single Data Record

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

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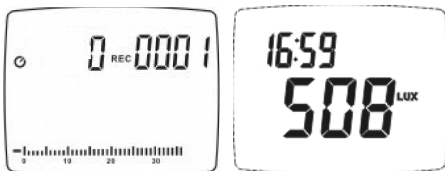
11 Auto Power Off

■ If you want disable auto power off, please

hold " ⚪ " button and push " ☼ " button, the

auto power off symbol will not display on the

LCD.

■ If you want enable auto power off please hold

" ⚪ " button and push " ☼ " button again.

The auto power off symbol will display on the

LCD.

■ Auto power off time is 30 minutes.

12 Relative Deduction Value(%)

■ Hold " ⓞ " button and push " 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 push " MAX/MIN " button
  again to exit REL mode.

13 Clock LCD Display

Press $\boxed{\text{TIME} \atop \text{MEM}}$ 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".

$00.20\ 12.3\ 12009.15$

14 Setup Mode

■ Hold " $\boxed{\text{①}}$ " button and push " $\boxed{\text{ADJ} \atop \text{SET}}$ " button into

the setup mode to use Auto Recording time

setup or Time setup function.

■ Hold " $\boxed{\text{①}}$ " button and Push " $\boxed{\text{TIME} \atop \text{MEM}}$ " button to

view records.

■ Hold " $\boxed{\text{①}}$ " button and Push " $\boxed{\text{☼}}$ " button to

disable Auto power off.

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15 Auto Recording Time Setup

■ Hold " ⓞ " button and push " ADJ/SET " button into

the setup mode to change setup function.

```
 ⚬ 1200 SET 5809
   0238
```

■ Push " ADJ/SET " button again into Auto Recording

Time Setup.

```
   0000 MEM/SET 00
```

Min:

■ Push " HOLD/▲ " or " ☀/▼ " button to change digit

■ Push " 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).   .

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Hour: 0000ᴹᴱᴹ 00   Sec: 0000ᴹᴱᴹ 00

■ Push "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.

00:00ˢᴱᵀ 00

■ Maximum auto recording time: 23 hours 59 minutes 59 seconds.

■ Minimum auto recording time: 1 second.

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16 Time clock Setup

■ Hold " ⓞ " button and Push " ᴬᴰᴶ/ꜱᴇᴛ " button to

change time setup mode.

```
⌐ 12:00⌐ᴺᴱᵀ 5809
  0238
```

■ This meter clock is 24 hour time setting.

■ Push " ᴴᴼᴸᴰ " or " ☼ " button to change digit

■ Push " ᴹᴬˣ/ᴹᴵᴺ " or " ᴿᴱᶜ/ᵁᴺᴵᵀ " to select option to
adjust

■ And pres " 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: `24:00⌐ᴺᴱᵀ 2 109  12.20` day: `24:00⌐ᴺᴱᵀ 2 109  12:21` Month: `24:00⌐ᴺᴱᵀ 2 109  12.20`

Year: `24:00⌐ᴺᴱᵀ 2 109  12.20` Sec: `24:00⌐ᴺᴱᵀ 2 109  12.20` Minute: `24:00⌐ 2 109  12.20`

■ Push " ᵀᴵᴹᴱ/ᴹᴱᴹ " button to store the setting.

■ Years time 2000~2099: display 00 ~ 99

17 Viewing Records

■ Hold " ⓞ " button and Push " TIME/MEM " button to view records.

■ Push" HOLD▲ " or " ☼▼ " button to scroll through the records.

Push" REC/UNIT " to change (BTU (ft²*h) →

W/m²→BTU (ft²*h)) / (FC→LUX→ FC)unit.

W/m²: 10.00 ʷ/ᵐ²   Btu(ft²*h): 10.80 Btu(ft²h)

Lux: 1888 ᴸᵁˣ   Fc: 10.80 ꜰᶜ

■ Push " TIME/MEM " button to change time data (H:M →M:D→year→ sec).

H:M 18.00 ᴹᴱᴹ   M:D 10.02 ᴹᴱᴹ

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year 2000 MEM   sec $:28$ MEM

■ Hold" ⓞ "button and push" TIME MEM "button again

to exit viewing records mode.

18 Battery Replacement

WARNING

If the LCD display "━╋" symbol, please replace the battery immediately.
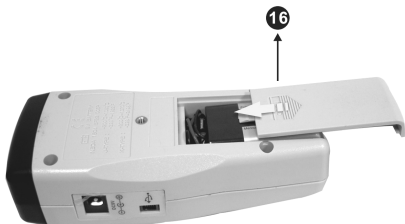
- Turn off the instrument.
- Open the battery covers and remove the battery.
- Replace with four-9V NEDA 1604, IEC 6F22 or JIS 006P size battery.
- Install the battery cover.

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19 External DC Power

- External AC to DC adapter: Voltage $9V_{DC}$($8\sim14V_{DC}$Max).
- Socket：pin Positive, Ground Casing External.
- Diameter 5.5mm internal Diameter 2.1 mm.
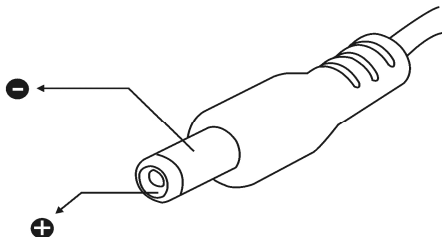
20 Computer Grade

- CPU：Pentium Ⅲ 1000MHZ.
- RAM：SDRAM 256MB.
- Hard Disk：200MB.
- OS：XP/Windosw7/Windows 8.1/Windows10.
- Display: 800×600 256 cooler.

21 Software installation

■ Please insert the CD into PC to install the software.
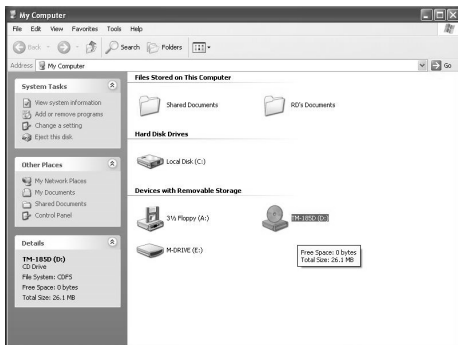
■ Please select the USB driver that will be installed, such as E:\ Light Meter Driver Setup.exe, click twice on the left key of the mouse to install the USB driver.
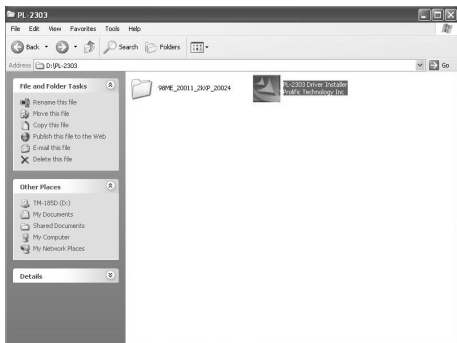
- Select the SETUP.EXE i.e., E:\Light Metre\SETUP.EXE and installs the desktop icon

Tack out the CD from PC after completed the installation of the desktop icon.
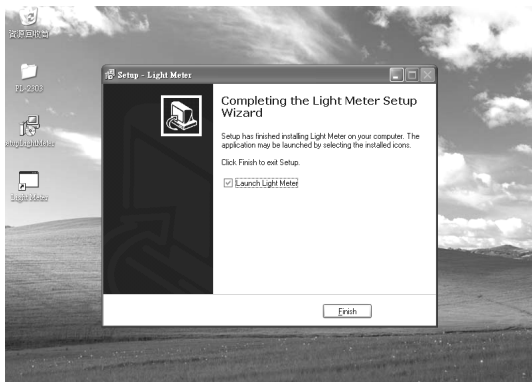
■ Use the USB cable to connect the meter and computer according to the drawing.
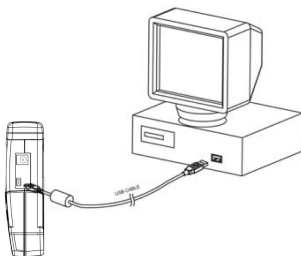
■ Select the desktop icon (Light Metre) and click twice on left key of the mouse to run the procedure.

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22 Safety and maintenance standards

- Operating altitude: below 2,000m.
- Operating environment: for indoor use, expose to pollution level II.
- This is a precision device. During use or storage, do not go beyond its spec. to prevent any possible damage or danger.
- Do not put this device in direct sunlight or where it is hot and/or damp.
- Remember to turn OFF the power after use. For long storage, remove the battery to prevent the battery from leaking to cause damage to the parts inside.
- Clean the device with a dry soft cloth. Wet

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cloths, liquid and water are prohibited.

23 Service
Warranty Conditions

This instrument is guaranteed for one year against material or production defects, in accordance with our general sales conditions. During the warranty period the manufacturer reserves the right to decide either to repair or replace the product.

Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage occurred in transit due to non-original packaging will be charged anyhow to the customer.

The warranty doesn't apply to:

- Accessories and batteries (not covered by warranty).
- Repairs made necessary by improper use (including adaptation to particular applications not foreseen in the instructions manual) or improper combination with incompatible accessories or equipment.

- Repairs made necessary by improper shipping material causing damages in transit.
- Repairs made necessary by previous attempts for repair carried out by non-skilled or unauthorized personnel.
- Instruments for whatever reason modified by the customer himself without explicit authorization of our Technical Dept.

The contents of this manual may not be reproduced in any form whatsoever without the manufacturer's authorization.

Our products are patented and our logotypes registered. We reserve the right to modify specifications and prices in view of technological improvements or developments, which might be necessary.

Shouldn't the instrument work properly, before contacting your distributor make sure that batteries are correctly installed and working, check the test leads and replace them if necessary.

Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage

occurred in transit due to non original packaging
will be charged anyhow to the customer.
The manufacturer will not be responsible for any
damage to persons or things.

24 End of life

	Caution
	this symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal

TENMARS ◆VFE◆

**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, CO_2 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**