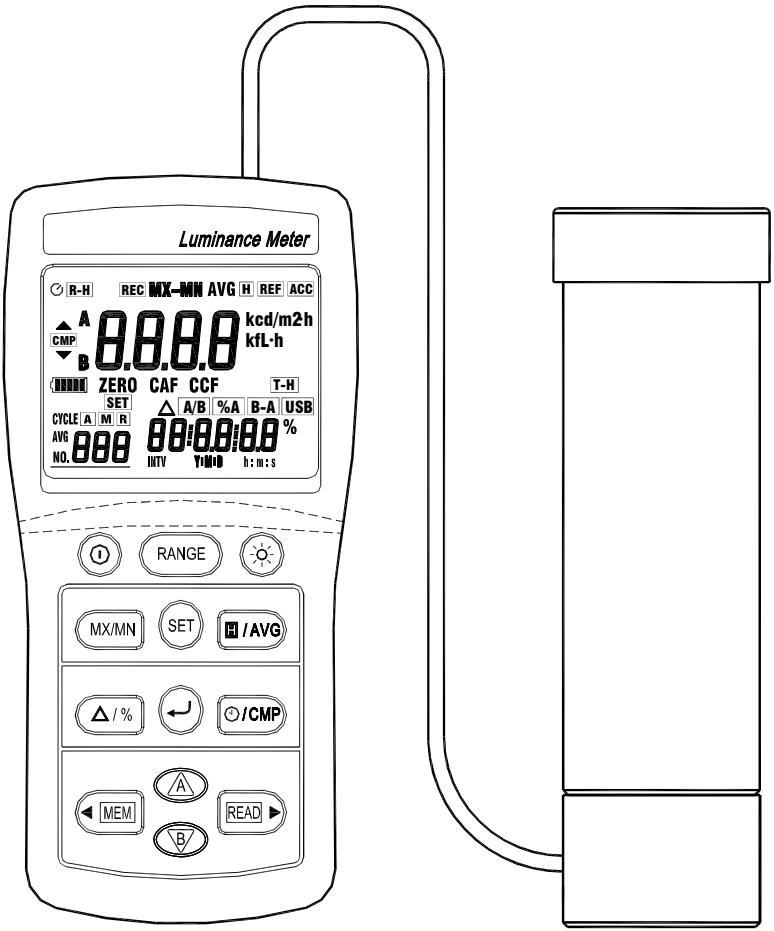
Luminance Meter

INSTRUCTION MANUAL

※Enclosed CD: Software & Protocol Inside.



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Title **Page**

1. INSTRUCTION

- ❑ The digital Luminance meter is a precision instrument used to measure Luminance in candles per square meter (cd/m^2) or foot-Lamberts (fL) in the field.
- ❑ It meets CIE photopic spectral response, f '$_1 \leqq$6%.
- ❑ The Luminance meter is compact, tough and easy to handle owing to its construction.
- ❑ The light sensitive component used in the meter is a very stable, long-life silicone photo diode and spectral response filter.
- ❑ Fully functional for professional requirements.
- ❑ **U.S. Pat. No. Des. 446,135**

2. FEATURES & APPLICATION

- ❑ Dual Display, 4-digit LCD reading.
- ❑ Spectral Sensitivity close to CIE photopic Curve.
- ❑ Measuring Levels Ranging: > 0.171 to 1999k cd/m^2, > 0.050 to 580.0k fL, Autoranging 7 step.
- ❑ Accurate and Instant response.
- ❑ Luminance ratio A/B, deviation %A, different B-A and peak luminance measurements.
- ❑ User calibration factor and color-correction functions.
- ❑ Accumulation luminance measurement.
- ❑ Max/Min/AVG function.
- ❑ Backlit function.
- ❑ Comparator function.
- ❑ Auto power off function.
- ❑ Data Hold function.
- ❑ Data memory and read function.
- ❑ Data logger function.
- ❑ USB Interface.

Applications:

The Luminance meter is a handy, easy to use and precision measuring instrument. It allows the accurate measurement of the luminance in cd/m^2 or fL.

1 cd/m^2 = 0.2919 fL = 0.0929 cd/ft^2

1 fL = 3.426 cd/m^2 = 0.3183 cd/ft^2

1 cd/ft^2 = 10.76 cd/m^2 = 3.142 fL

Contact Measurements

Placed directly on the surface to be measured:

Suitable for measuring

- monitors
- television screens
- light boxed
- light displays

Measuring at a Distance

The measuring angle being 2 degree.

Suitable for measuring

- monitors taking the existing ambient light into consideration
- lighting of streets areas
- lighting of sports areas
- lighting contrasts at work stations
- lighting in museums
- uniform illumination of projection screens

3. SPECIFICATIONS

Display: Dual display 4 digit LCD read out.

Measuring Range: 9.999, 99.99, 999.9, 9.999k, 99.99k, 999.9k, 1999k cd/m^2
9.999, 99.99, 999.9, 9.999k, 99.99k, 580.0k fL
Auto ranging (7 step) (1 fL = 3.426 cd/m^2)
Minimum measurement range: > 0.171cd/m^2 (> 0.050fL)

Measuring Angle: 2°

Overrange Display: OL is displayed

Resolution: 0.001 cd/m^2, 0.001 fL

Accuracy: ±3%rdg±5dgt on all ranges except 9.999 and 99.99 ranges is ±10%rdg±10dgt.
(Calibrated to standard incandescent lamp, 2856°K, at 25℃/77℉)

CIE Photopic f '1: ≦6%

Temperature Characteristics: ±0.1%/℃

Measuring Rate: Approximately 5 time/sec

Photosensor: Silicon photodiodes

Data Memory Capacity: 200 sets. (Direct reading from LCD display)

Data Logger Capacity: microSD CARD

Operating/Storage Conditions: 0℃ to 50℃<80% RH/-10℃ to 60℃<70%RH

Power Source: 6 pcs 1.5V AAA size Battery

Battery Life (typical): 50 hours

Photosensor Lead Length: 90 cm (approx.)

Photosensor Dimensions: 40ϕ×158(L)mm

Dimension: 150(L) × 72(W) × 35(H)mm

Weight: Meter: 235g

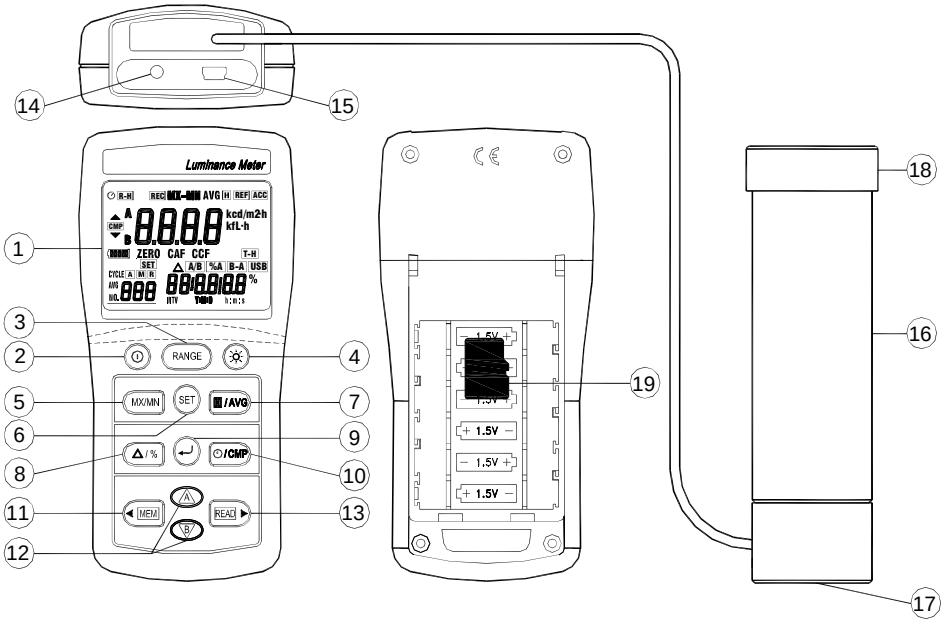
Photosensor: 210g

Accessories: Carrying case, Instruction manual, Battery, CD software, Micro-USB cable.

Option Accessories: AC adaptor 9VDC 100mA.

4. PARTS & CONTROLS

4-1 Description of Parts & Control keys



1. LCD Display: 4 digit display with a maximum of 9999 readings and the indicating signs of measured values, unit function symbols and decimal points etc. are displayed.

2. ⏻ Power Control key:

① Press one time to turn on the meter.

② Press this key for 3 seconds to turn off the meter.

3. RANGE key:

① Press this key one time to enter the manual range mode. Shows " **R-H** "on LCD.

② Press this key again to select the desired range.

③ Press this key for 3 seconds to return to auto ranging mode.

4. ☼ key:

① Backlight function key, press this key to turn on and off the backlingt will switch off automatically after the backlight setting time.

② Press this key for 3 seconds to disable the auto backlight timeout.

5. MX/MN key:

MAX MIN Recording Mode: Press this key to enter this recording mode.
Press this key to circulate the reading of Current, Maximum, Minimum, Maximum-Minimum, and Average. Press this key 3 seconds to exit this mode.

6. SET key: Press this key to enter the setting mode.
Press this key for 3 seconds to exit this mode.

SET01 : Measurement unit cd/m^2 or fL setting mode.
SET02 : Real time setting mode.
SET03 : Comparator High/Low value setting mode.
SET04 : User calibration factor value setting mode.
SET05 : Color-correction factor value setting mode.
SET06 : Accumulate luminance measurement on-off setting mode.
SET07 : Auto datalogging interval time setting mode.
SET08 : No-cycle timer datalogging setting mode.
SET09 : Auto-cycle timer datalogging setting mode.
SET10 : Auto power off time setting mode.
SET11 : Backlight time setting mode.
SET12 : Clear the manual memorized data.
SET13 : Clear the auto memorized data.

7. H / AVG key:

① **H HOLD key**: Press this key momentarily to freeze or unfreeze the displayed reading.

② **AVG key**: Press this key for 3 seconds to enter or exit point average measurement function.

8. △/% key:

① Reference quantity measurement mode (A/B %A B-A).
Press this key to enter this mode, press this key for 3 seconds to exit this mode.

② Relative & percent measurement mode (△,%). Press this key for 3 seconds to enter or exit this mode.

9. ↵ key:

① Store the displayed setting value or exit a setting mode.

② Recall the CAF, CCF or other for use in measurement.

10. ⏲ / CMP key:

① ⏲ **Time key**: Press this key to switch the display of hour : minute : second, year I month I day and exit. The real time will be displayed if the real time setting function was performed, otherwise the elapsed time will be displayed.

② **CMP key**: Press this key for 3 seconds to enter or exit the comparator mode.

11. ◀ **MEM key**:

① ◀ **key**: In the setting mode, press this key move flashing cursor to left.

② **MEM key**: a). Memory function: Press this key one time to store a measuring value.

b). Press this key for 3 seconds to enter or exit the datalogging mode.

12. △ , ▽ **key**:

① △ ▽ **key**: In the setting mode, press this key to increase, decrease the displayed setting.

In the READ mode, press this key to increase/decrease the memory location.

② **A, B key**: In the reference quantity measurement mode (A/B %A B-A), press △ key to acquire measured value A is used as a reference value. Press ▽ key to acquire measured value B then the calculated value A/B, %A or B-A can be displayed by pressing the △**/%** key.

13. **READ** ▶ **key**:

① ▶ key: In the setting mode, press this key move flashing cursor to right.

② **READ key**:

Read function: Press this key to enter the READ mode, then press △ or ▽ key to select the desired stored number of data to read. Press this key again to exit.

14. AC adaptor socket (9V, 100mA). 

15. Micro-USB

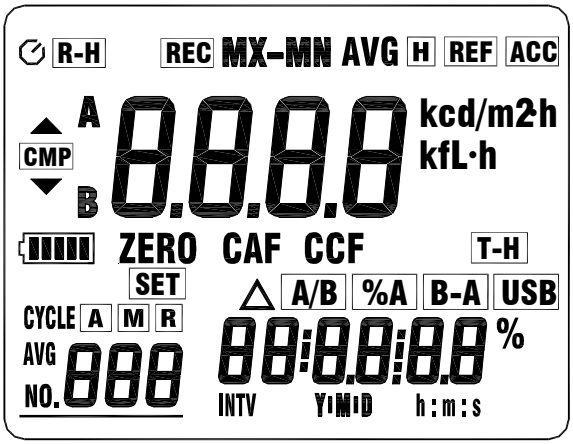
16. Photo Detector.

17. Tripod mounting: 1/4”-20 unc female thread.

18. Photo Detector Cap.

19. microSD CARD.

4-2 Description of Display



: Auto power off indication.

R-H : Manual range indication.

REC : Recording mode indication & current reading.

REC MX : Maximum reading.

REC MN : Minimum reading.

REC MX-MN : (Maximum – Minimum) value.

REC AVG : $(\frac{\text{Maximum}+\text{Minimum}}{2})$ value.

H : Data hold mode.

REF : Setting reference value or reference value displayed.

ACC : Accumulated luminance measurement mode indication.

CMP : Comparator mode indication.

▲ : Comparator high limit value is exceeded or setting indication.

▼ : Comparator low limit value is lowered or setting indication.

A : Acquire measured value A is used as a reference value for the reference quantity measurement mode indication.

B : Acquire measured value B for the reference quantity measurement mode indication.

cd/m^2 , kcd/m^2 , fL , kfL : Luminance unit of measure.

cd/m^2·h, kcd/m^2·h, fL·h , kfL·h : Accumulated luminance unit of measure.

: Battery capacity indication.

: Low battery indication.

ZERO : Zero adjustment indication.

CAF : Calibration factor indication.

CCF : Color correction factor indication.

T-H : Preset start/stop time datalogging mode indication.

SET : Setting mode indication.

CYCLE : Auto-cycle timer datalogging mode indication.

CYCLE
NO. 888 : The number of accumulated luminance maximum indication value 9999k is exceeded indication.

A : Datalogging mode indication.

M : Displays one time store one sets data into the memory.

M
NO. 888 : Manual memory address number indication.

R : Read mode indication.

R
NO. 888 : Recall manual memory adress number indication.

AVG : Point average mode indication.

AVG
NO. 888 : Point average number indication.

A/B : Ratio mode indication ($\frac{A}{B}$)

%A : Percentage deviation mode indication ($\frac{B-A}{A}$ x 100%)

B-A : Difference mode indication (B – A)

USB : PC communication indication.

△ : Relative mode indication (Present value – Reference value).

% : Percent mode indication ($\frac{\text{Present value}}{\text{Reference value}}$ x 100%).

88:88:88 **h:m:s** : Indicates the elapsed time or the real time (hour:minute:seconds).

88:88:88 **Y IMI D** : Indicates the elapsed date or the real date (year Imonthl day).

INTV : Datalogging interval time indication.

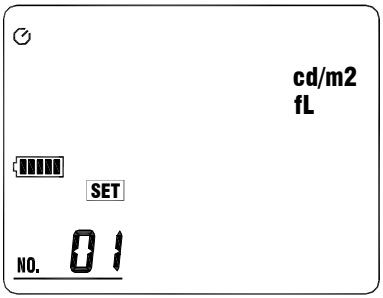
5. OPERATING INSTRUCTIONS

Zero Adjustment

The meter performs zero adjustment automatically when the power comes on. This adjustment need to attach the photo detector cap.

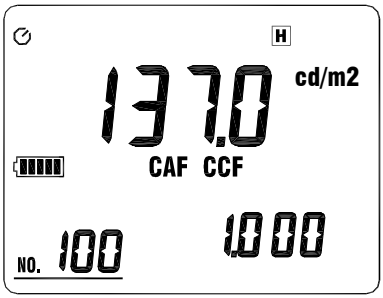
5-1 Selecting Luminance Unit cd/m^2 or fL

1. Press the ⏻ key to turn on the meter.
2. Press **SET** key, the annunciator "**SET 01**" is displayed.
3. Press △ key to select "**cd/m^2**" unit or press ▽ key to select "**fL**" unit.
4. Press ↵ key to store the desired measure unit.



5-2 Luminance Measurement

1. Press the ⏻ key to turn on the meter.
2. Remove the photo detector cap and face it align to the point to be measured field.
3. Read the luminance value from the LCD display.
4. Press **H** key, if the displayed value need to be hold. Press **H** key again to exit the data hold mode.
5. Press ↵ key to view CAF and CCF values for use in measurement.
6. Press 🕐 key to display the time or date.



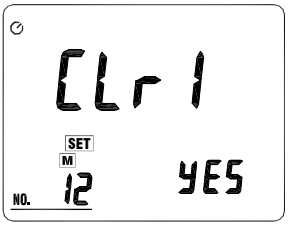
7. Manual data memory and read operations.

① To clear the manual memorized data.

a). Press **SET** key twelve times to change the setting mode to "**SET 12**", the annunciator "**M CLr1 no**" is displayed.

b). Press △ key to select "**YES**" or press ▽ key to select "**NO**" , then press ↵ key to exit.

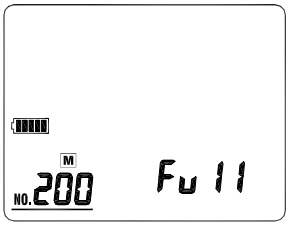
If you select "**YES**" the memorized data will be cleared.



② To memorize the reading.

a). Press **MEM** key each time will store one set of the measured value to the memory. At this moment, LCD will show the " **M** " mark and the memory address number. Total memory size is 200 sets.

b). When the memory is full, LCD will show " **M FULL**" mark.



③ To recall the memorize data.

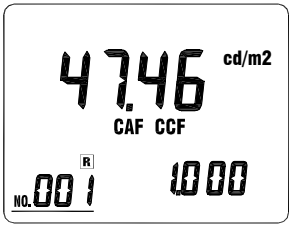
a). Press **READ** key to enter the READ mode, the LCD will show " **R** " mark and the memory address number.

b). Press △ or ▽ key to select the desired memory address number data for display.

c). Press ↵ key to view CAF and CCF values for use in measurement.

d). Press ⏲ key to display the stored time or date.

e). Press **READ** key again to exit.



5-3 Maximum & Minimum Reading Measurement

1. Press the ⏻ key to turn on the meter.
2. Remove the photo detector cap and face it align to the point to be measured field.
3. Press **MX/MN** key to enter the recording mode. The maximum, minimum, and average values are then reset to the present reading, LCD shows " **REC** " mark and the auto power off function is disabled.
4. Press **MX/MN** key to cycle switch displaying the

   Maximum (**REC** **MX**) reading with its recorded time.

   Minimum (**REC** **MN**) reading with its recorded time.

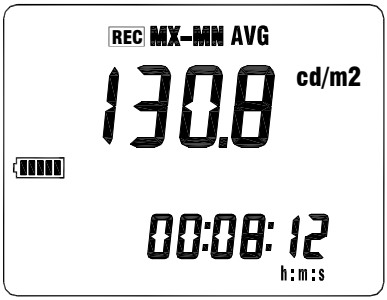
   Maximum – Minimum (**REC** **MX-MN**) value with time difference between them.

   Average (**REC** **AVG**) value with the recording elapsed time.

   Current (**REC**) reading with current time.
5. Press 🕐 key to display the date and time of recorded data. The real time will be displayed, if the real-time setting function was performed, otherwise the elapsed time will be displayed.

6 Press ↵ key to view CAF and CCF values for use in measurement.

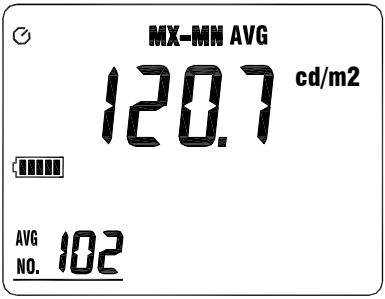
7. Press **H** key to paused recording, the "**H**" symbol is displayed, press **H** key again will resume recording.
8. Press **MX/MN** key for 3 seconds to exit.



5-4 Point Average Measurement

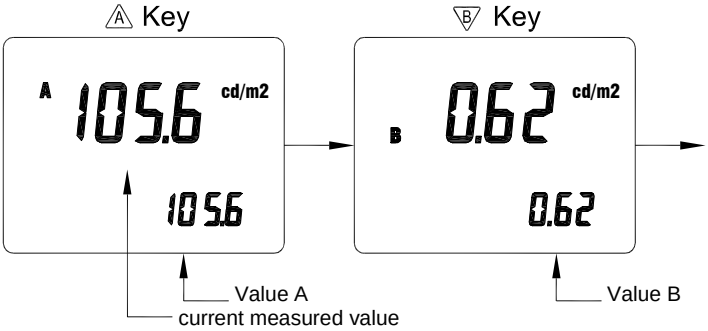
1. Press the ⏻ key to turn on the meter.
2. Remove the photo detector cap and face it align to the point to be measured field.
3. Press **AVG** key for 3 seconds to enter this mode, LCD shows " **AVG Noxxx** " the last time point average memorized data.
4. Press ↵ key for 3 seconds to clear the last time point average memorize data, LCD shows " **AVG No 000** " number.

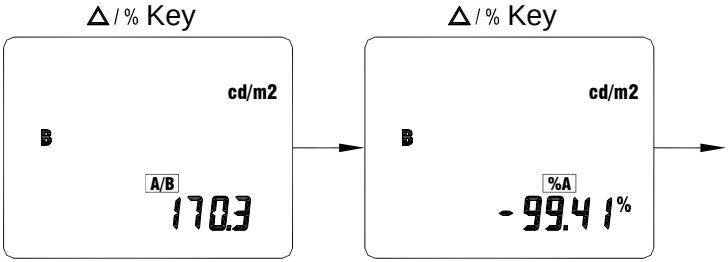
5. Press **MEM** key each time will store one measured point value into memory. The memorized address number " **AVG No.xxx** " is displayed. The maximum measurement is 200 points.
6. When the measurement is pause or completed, press **MX/MN** key to switch displaying the measured points:
   Maximum (MX) reading with its address number →
   Minimum (MN) reading with its address number →
   Maximum – Minimum (MX – MN) value →
   Average (AVG) value (all point average value) with all point number → exit.
   It is also possible to press **READ** key to enter the READ mode [refer to 5-2-7-③].
7. Press **AVG** key for 3 seconds to exit this mode.

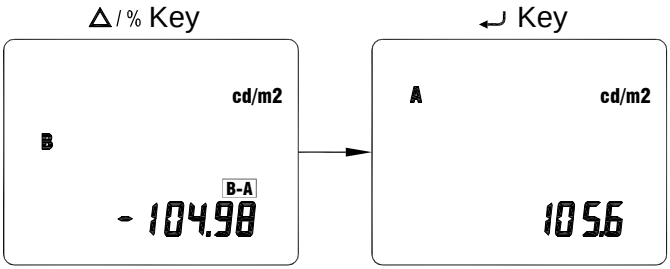


5-5 Reference Quantity Measurement (A/B %A B-A)

1. Press the ⏻ key to turn on the meter.
2. Press △**/%** key to enter this mode, LCD shows "**A**" mark.
3. Remove the photo detector cap and face it align to the point to be measured field.
4. Press Ⓐ key to acquire measured value A is used as a reference value for the following functions.
5. Now the photo detector align to the second point.
6. Press Ⓑ key to acquire measured value B, the calculated value for the respective function appears at the display.
7. Press △**/%** key to display the calculated value A/B, %A or A-B.
8. Repeat step 5 to 7 for the other point measurement.
9. Press ↵ key to view CAF, CCF, A and B values.
10. Press △**/%** key for 3 seconds to exit.







Note:

Ratio A/B: This function is used, for example, for contrast measurements and luminance distribution at workstations.

Percentage Deviation %A: This function is used, for example, for testing monitor screen uniformity (percentage deviation of screen corners from the reference value at the middle of the screen).

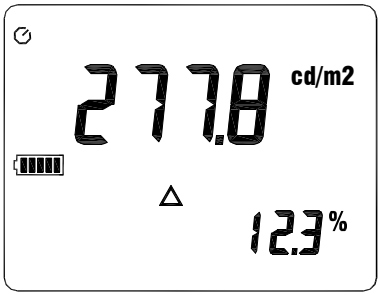
Difference A-B: This function is used, for example, for detecting deviations in manufacturing (read the difference between reference value A and the second measured value B directly from the display).

5-6 Making Relative Measurement

The meter display calculated values that are based on a stored reference value.

Use the current measured value as the reference value.

1. Press △**/%** key for 3 seconds to store the reference value and enter the relative mode. The "△" mark and indicates the difference between the present measurement and the reference value are displayed.
2. Press △**/%** key again to enter the percent mode. The "**%**" mark and the calculated value are displayed.
3. Press ↵ key to view the reference REF, CAF and CCF values.
4. Press △**/%** key for 3 seconds to exit.

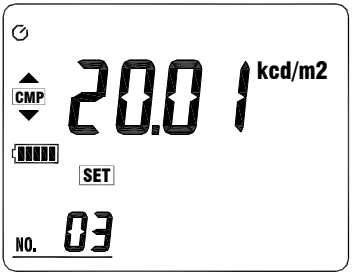


5-7 Using Comparator Function

The comparator function compares the measured value with preset High (▲) and Low (▼) limit values.

5-7-1 Setting the comparator

1. Press **SET** key three times to change the setting mode to " **SET** **03** " and to enter the comparator High limit value setting mode, the annunciator " ▲ **CMP** " and the flicking decimal point are displayed.
2. Press △ or ▽ key to set to the desired decimal point position.
   When the three decimal point are flicking means no decimal point is need.
3. Press ▶ key and move to the flicking of unit. Press △ key to select "**K**" or press ▽ key to delete "**K**".
4. Press ▶ key and move to the flicking first number of the value.
   Press △ or ▽ key to set the desired number.
5. Repeat step 4 for the othe three number of the value setting.
6. Press ↵ key to store the High limit value setting and to enter the Low limit value setting mode, the annunciator " ▼ **CMP** " and the flicking decimal point are displayed.
7. Repeat step 2 to 5 to setting the desired Low limit value.
8. Press ↵ key to store the setting and exit.

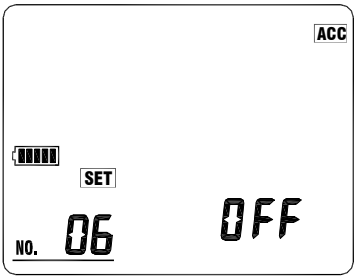


5-7-2 Comperator operation

1. Press **CMP** key for 3 seconds to enter the comperator function. The annunciator " **CMP** " is displayed.
2. If the measured value exceeds the setting value, the annuciator ▲ or ▼ will be displayed and the beeper will sound.
3. Press **CMP** key to exit this function.

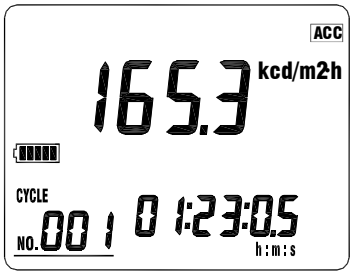
5-8 Using Accumulated Luminance Function

1. Press **SET** key six times to change the setting mode to " **SET 06** ", the annunciator " **ACC** " and the "**OF**F" mark flicking are displayed.



2. Press △ key to select "**On**".
3. Press ↵ key to start the accumulated luminance measurement function, the luminance unit "**·h**" mark is displayed and the measurement elapsed time is started. The maximum accumulation time is 9999 hours (approx. 1.2 years). In this function the auto power off function is disabled.
4. During measurement, press **H** key can be used to pause and resume the measurement.

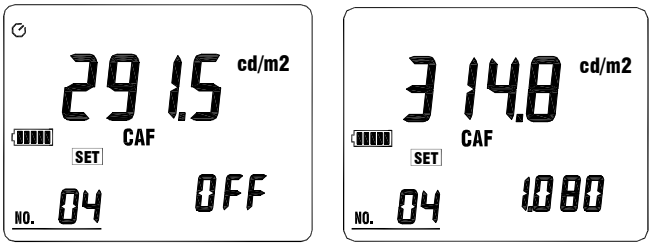
5. During measurement, press ⏲ key to view the measurement elapsed time h:m:s and Y IMI D.
6. The maximum indication of accumulated luminance value is 9999K. When this value is exceed, the number of accumulated can be checked by annunciator "**CYCLE No.xxx**". The maximum number of CYCLE is up to 999.
7. Press ↵ key to stop this measurement.
   Press ⏲ key to view the total measurement elapsed time h:m:s and Y IMI D.
   Press ↵ key again to exit this measurement.



5-9 Setting the Calibration Factor (CAF)

The CAF allows the user to calibrate the meter to any subject desired. It can be used to calibrate the meter to another standard subjest for which the luminance is known, to precisely standardize meters to the same subject.

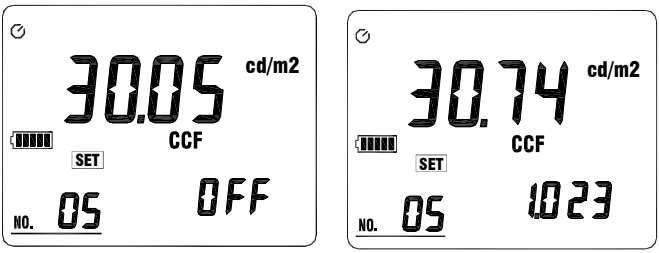
1. Press **SET** key four times to change the setting mode to "**SET 04**", the annunciator "**CAF**" and "**On**" or "**OFF**" are displayed.
2. Press △ key to select "**On**" or press ▽ key to select "**OFF**".
3. If select "**OFF**" then press "▶" key to use factory default value "**1.000**" is displayed. Press ↵ key to exit
4. If select "**On**" then press ▶ key to enter CAF setting mode, the calibration preset data is flicking displayed.
5. Remove the photo detector cap and face it align to the standard subject, until the meter reading is stable.
6. Press △ and ▽ key to change the CAF values until the luminance value is same as the standard subject value. The CAF can be set between 0.001 to 9.999.
7. Press ↵ key to store the user CAF value and exit.



5-10 Setting the Color Correction Factor (CCF)

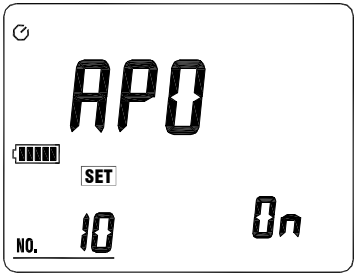
The CCF can be used to adjust the spectral response of the meter to more accurately measure subjects with color greatly different than the calibration standard. CCF are normally determined based on measurements using a spectrophotometer.

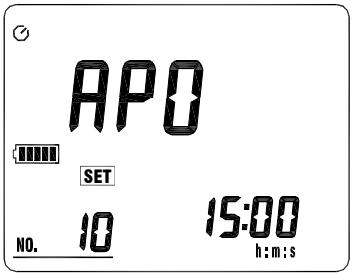
1. Press **SET** key five times to change the setting mode to "**SET 05**", the annunciator "**CCF**" and "**On**" or "**OFF**" are displayed.
2. Press △ key to select "**On**" or press ▽ key to select "**OFF**".
3. If select "**OFF**" then press ▶ key to use factory default value "**1.000**" is displayed. Press ↵ key to exit
4. If select "**On**" then press ▶ key to enter CCF setting mode, the calibration preset data is flicking displayed.
5. Press △ and ▽ key to set to the desired CCFvalues. The CCF can be set between 0.001 to 9.999.
6. Press ↵ key to store the user CCF value and exit.



5-11 Setting the Auto Power Off Time

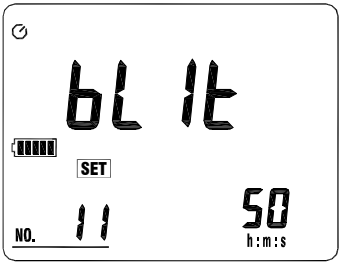
1. Press **SET** key ten times to change the setting mode to "**SET 10**", the annunciator "**APO**" and "**On**" or "**OFF**" are displayed.
2. Press △ key to select "**On**" or press ▽ key to select "**OFF**".
3. If select "**OFF**" then press ▶ key to disable auto power off function and exit.
4. If select "**On**" then press ▶ key to enter the auto power off time setting mode, the previouslu auto power off time and two flicking digits (minute) are displayed.
5. Press △ and ▽ key to set the desired minute from 00 to 59 minutes.
6. Press ▶ key and move to the two flicking numbers of second.
7. Press △ and ▽ keys to set the desired second form 30 to 59 seconds.
8. Press ↵ key to store the auto power off time and exit.





5-12 Setting the Backlight Timeout

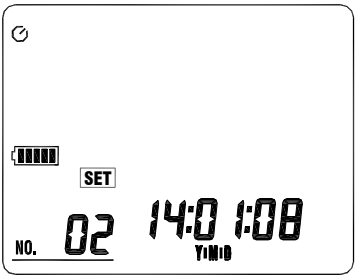
1. Press **SET** key eleven times to change the setting mode to "**SET 11**", the annunciator "**bLIt**" and the backlight preset time are displayed.
2. Press △ or ▽ key to set desired backlight time from 1 to 59 seconds.
3. Press ↵ key to store the setting value and exit.

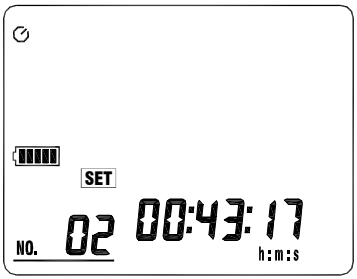


5-13 Setting the Real-Time

The meter internal clock is used in the display and for time-stamping recorded measurements.

1. Press **SET** key two times to change the setting mode to "**SET 02**", the annunciator "**Y IMI D**" and the flicking first number of year are displayed.
2. Using ◀ and ▶ keys, position the cursor on the date or time element to adjust.
3. Use △ and ▽ keys to change the selected date or time element value.
4. Press ↵ key to complete the action.





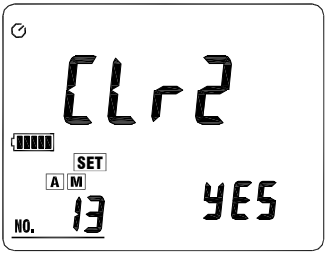
5-14 Auto Datalogging

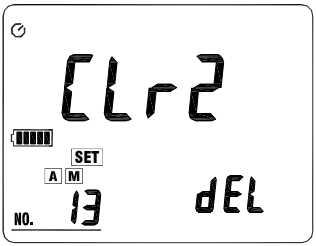
1. Clear the auto memorized data.

① Press **SET** key thirteen time to change the setting mode to "**SET 13**", the annunciator " **A M** " and "**CLr 2 no**" are displayed.

② Press △ key to select "**YES**" or press ▽ key to select "**No**" , then press ↵ key to exit.

③ If you select "**YES**", press ↵ key to perform clear the auto memorized data, the "**dEL**" mark is displayed, when the "**dEL**" mark is disappeared, the clear work is finished. If no SD CARD in the meter, the "**no CArd**" mark is displayed 2 seconds then exit.





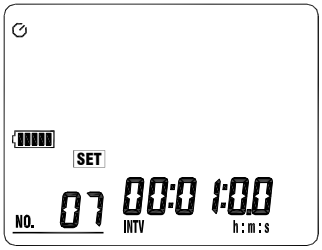
2. Interval time setting.

① Press **SET** key seven times to change the setting mode to "**SET 07**", the annunciator "**INTV h:m:s**" and the flicking first number of hour are displayed.

② Press ◀ and ▶ keys, position the cursor on the time element to adjust.

③ Use △ and ▽ keys to change the selected time element value.

④ Press ↵ key to complete the cation.



3. Auto data memory

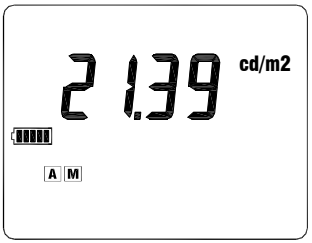
① Press **MEM** key for 3 seconds to record data automatically.

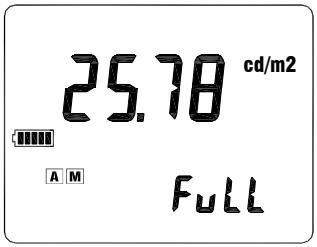
The annunciator "**A**" is displayed, when the "**M**" mark appear one time, one set of reading is stored to the memory.

② If no SD CARD in the meter, the "**no CArd**" mark is displayed 2 seconds then exit.

③ If memory is full, the "**A M FULL**" mark is displayed.

④ Press **MEM** key for 3 seconds to exit.



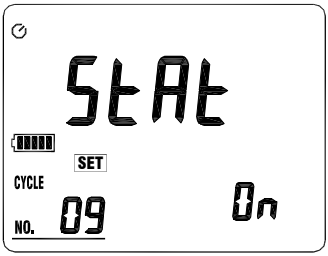


4. Download the recording data to PC connect the USB cable to PC and the meter.

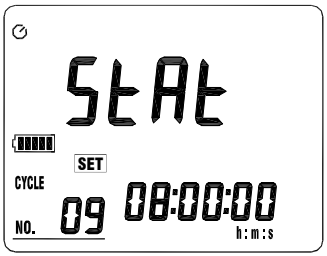
5-15 Auto-Cycle Timer Datalogging

The auto cycle timer means the starting time and the stopping time is valid in the everyday.

1. Perform setting the Real-Time. (refer to 5-13)
2. Press **SET** key nine times change the setting mode to "**SET 9**", the annunciator "**CYCLE StAt**" and "**on**" or "**OFF**" are displayed.
3. Press △ key to select "**On**" or press ▽ key to select "**OFF**".

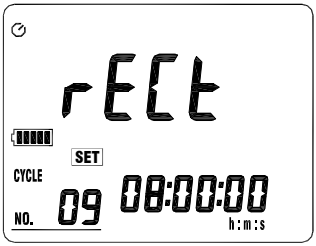


4. If select "**OFF**" then press ▶ key to exit.
5. If select "**On**" then press ▶ key to enter the Start-Time setting mode, the flicking number of hour is displayed.
6. Using ◀ and ▶ keys, position the cursor on the time element to adjust.
7. Use △ and ▽ keys to setting the selected time element value.

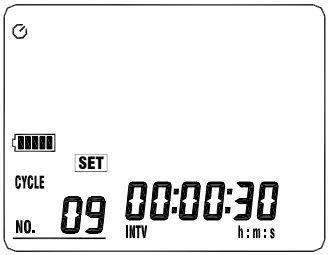


8. Press ▶ key to enter the Record-Time setting mode, the "**rECt**" and the flicking number of hour are displayed.

9. Repeat step 6 and 7 to complete the record-time setting.



10. Press ▶ key to enter the Interval-Time setting mode, the "**INTV**" and the flicking number of hour are displayed.
11. Repeat step 6 and 7 to complete the interval time setting.



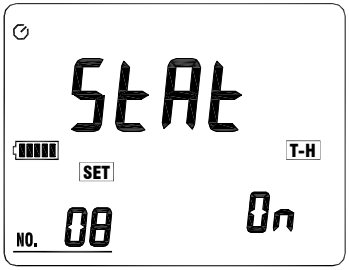
12. Press ↵ key to complete the action and to enter the auto-cycle timer datalogging mode, the "**CYCLE**" mark is flick displayed.
13. In this datalogging mode if Auto-power off function is enabled, the meter will enter a battery saver mode if a key is not pressed. In the battery saver mode will shutdown circuits not necessary, including the display. However, the Backlignt will continue to flash (one time per 10 seconds) to indicate the meter was waiting for the collect data.
14. When the starting time is reached, the "**A**" mark is displayed and the "**CYCLE**" mark is stop flick. When the "**M**" mark flick one time means one set of data has been memorized.

15. If no SD CARD in the meter, the "**no CArd**" mark is displayed 2 seconds then exit.
16. If memory is full, the "**A M FULL**" mark is displayed.
17. Press "**MEM**" key for 3 seconds to exit.

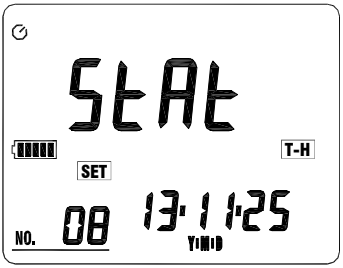
5-16 No-Cycle Timer Datalogging

The no cycle timer means the starting-time and the end-time is valid only one time.

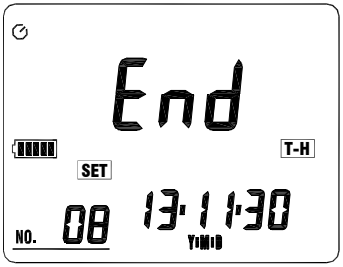
1. Perform setting the Real-Time. (refer to 5-13)
2. Press **SET** key eight times to change the setting mode to "**SET 08**", the annunciator "**T-H StAt**" and "**On**" or "**OFF**" are displayed.
3. Press △ key to select "**On**" or press ▽ key to select "**OFF**".



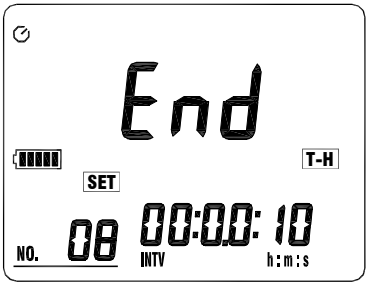
4. If select "**OFF**" then press ▶ key to exit.
5. If select "**On**" then press ▶ key to enter the Start-Time setting mode, the flicking number of year is displayed.
6. Using ◀ and ▶ keys, position the cursor or the date and time element to adjust.
7. Use △ and ▽ keys to setting the selected date or time element value.



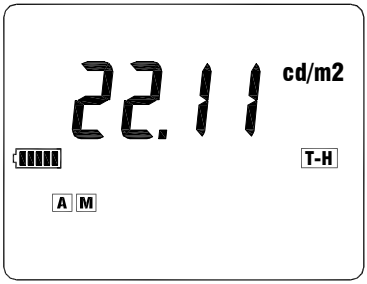
8. Press ▶ key to enter the End-time setting mode, the "**End**" and the flicking number of year is displayed.
9. Repeat step 6 and 7 to complete the end-time setting.



10. Press ▶ key to enter the Interval-Time setting mode, the "**INTV**" and the flicking number of hour are displayed.
11. Repeat step 6 and 7 to complete the interval time setting.



12. Press ↵ key to complete the action and to enter the no-cycle timer datalogging mode, the "**T-H**" mark is flick displayed.
13. In this datalogging mode if Auto-Power off function is enabled, the meter will enter a battery saver mode if a key is not pressed. In the battery saver mode will shutdown circuits not necessary, including the display. However, the Backlignt will continue to flash (one time per 10 seconds) to indicate the meter is still collecting data.
14. When the starting time is reached, the "**A**" mark is displayed and the "**T-H**" mark is stop flick. When the "**M**" mark flick one time means one set of data has been memorized.



15. If no SD CARD in the meter, the "**no CArd**" mark is displayed 2 seconds then exit.
16. If memory is full, the "**A M FULL**" mark is displayed.
17. Press "**MEM**" key for 3 seconds to exit.

6. BATTERY CHECK-UP & REPLACEMENT

1. Battery level indicator

Indication	Battery Capacity
	100% capacity
	80% capacity
	60% capacity
	40% capacity
	20% capacity
	Almost empty

2. As the battery power is not sufficient, LCD will display "  " ; battery replacement of standard AAA-size 6 pcs 1.5V batteries is required.

3. Unscrews the big screw on the back of the meter and remove the battery cover.

4. Disconnect the batteries from the instrument and replace them with standard AAA-size 6 pcs 1.5V batteries and replace the battery cover.

Note : Make sure the battery polarity is installed as indicated.

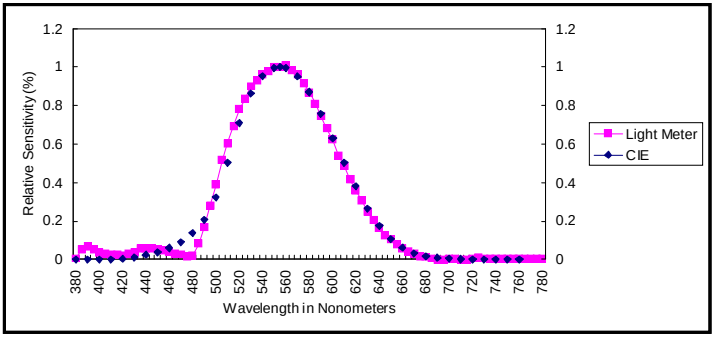
5. Prevention of battery fluid leakage:

① When the battery power is low, replace the new battery in order to avoid the further battery fluid leakage possibility.

② When the meter will not be in use for the long period of time, please remove the batteries out of meter to prevent the possibility of battery fluid leakage damage.

7. SPECTRAL SENSITIVITY CHARACTERISTIC

The sensor of this instrument together with its filter gives a spectral sensitivity characteristic close to photopic curve Vλ of C.I.E. (INTERNATIONAL COMMISSION ON ILLUMINATION) as described in the following chart.



8. MAINTENANCE

1. The lens on the top of the detector should be cleaned with a damp cloth when necessary.
2. Do not store the instrumentthe instrument where temperaturewhere temperature or humidity is excessively high.
3. The calibration interval for the photo detector will vary according to operational conditions, but generally the sensitivity decreases in direct proportion to the product of luminous intensity by the operational time. In order to maintain the basic accuracy of the instrument, periodic calibration is recommended.

9. SOFTWARE INSTALLATION and OPERATION

- ❑ For the detailed instruction, please refer to the content of attached CD-ROM, which has the complete instruction of software operation and relevant information.
- ❑ Protocol: are enclosed within the content of CD-ROM, please open the CD-ROM for details.