

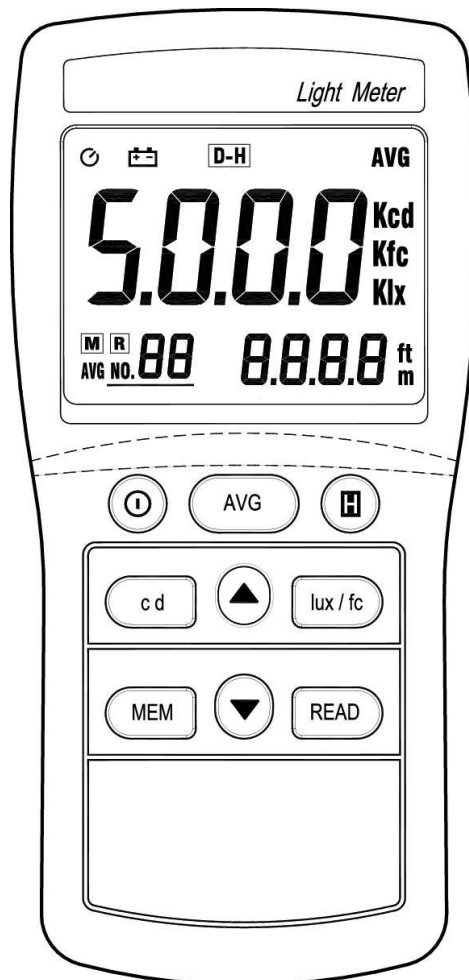


# Instruction Manual

## ILM-01

### Light Meter

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## 1. INTRODUCTION

- The ILM-01 digital illuminance meter is a portable precision instrument used to measure illuminance ( lux, footcandle ) in the field.
- It meets the CIE photopic spectral response,  $f'_1 \leq 6\%$ .
- It is fully cosine corrected for the angular incidence of light.
- The illuminance meter is compact, robust and easy to operate due to its construction.
- The light sensitive components used in the meter are a very stable, long-life silicon photodiode and spectral response filter.
- U.S. Pat. No. 446,135**

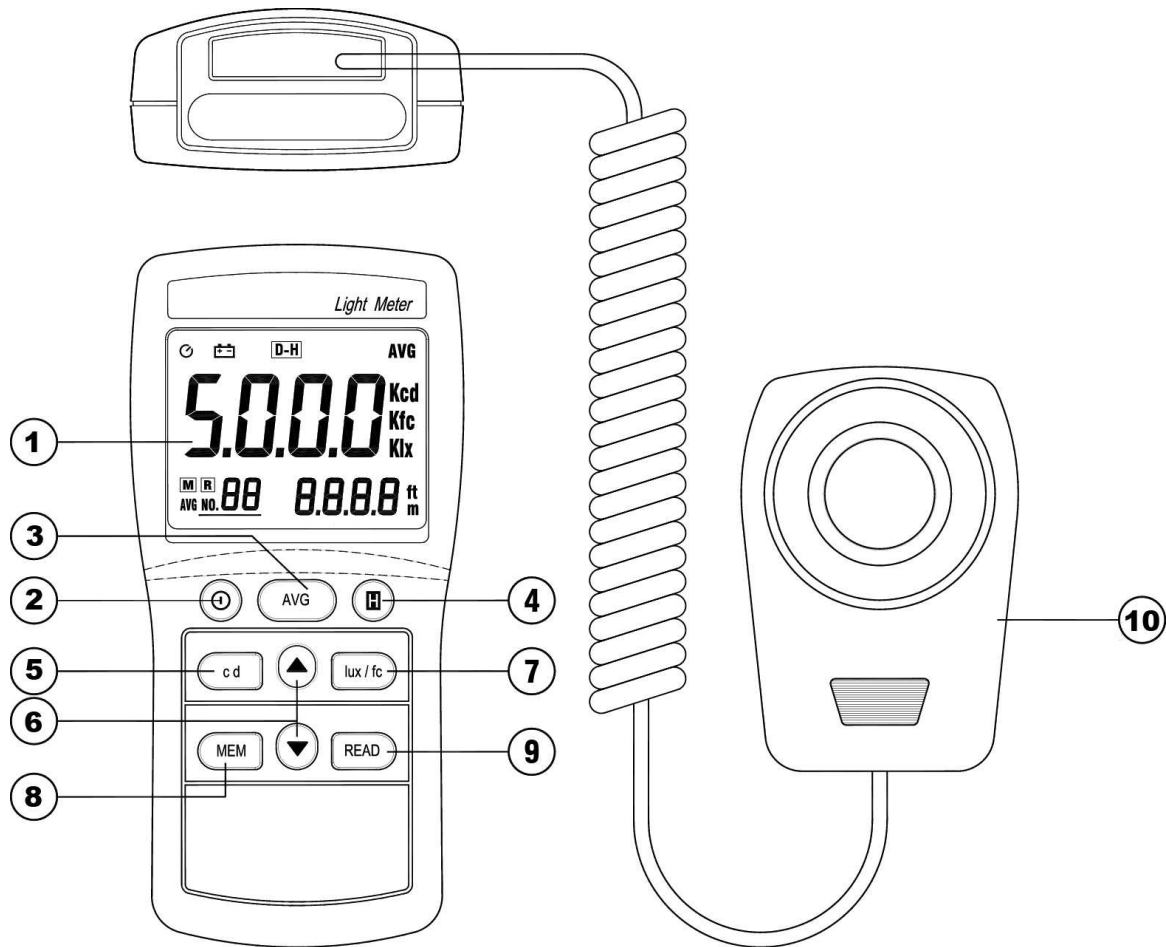
## 2. FEATURES




- Dual display, 4 digit LCD readout.
- Spectral sensitivity close to CIE photopic curve.
- Measuring levels: 0.01 lux to 50.00 klux, 0.001 fc to 5.000 kfc, in 4 ranges.
- Accurate and instant response.
- Luminous intensity measurement.
- Data-hold function.
- Data memorize and read function.
- Point-average function.
- Auto power-off function.

### 3. SPECIFICATIONS

- **Display** : Dual display, 4 digit LCD readout.
- **Measuring range** : 50.00 lux, 500.0 lux, 5000 lux,  
50.00 klux, (Autoranging 4 step) /  
5.000 fc, 50.00 fc, 500.0 fc, 5000 fc  
Note: 1fc =10.76 lux.
- **Ovrange display** : LCD will show “OL” symbol.
- **Spectral response** : CIE Photopic. (CIE = human eye response curve).
- **Spectral accuracy** : CIE  $V_{\lambda}$  function  $f'_1 \leq 6\%$
- **Cosine response** :  $f'_2 \leq 2\%$
- **Accuracy** :  $\pm 3\%$ rdg  $\pm 5$ digits (@23°C  $\pm 5^{\circ}$ C)  
(Calibrated to standard incandescent lamp at a colour temperature of 2856 K)
- **Temperature characteristics** :  $\pm 0.1\%/^{\circ}$ C.
- **Sampling rate**: 5 times/sec.
- **Photo detector** : Silicon photo diode and spectral response filter.
- **Manual data memory capacity** : 99 sets.
- **Operating temperature & humidity** :  
0°C to 50°C ( 32°F to 122°F ) & 0% to 80% RH.
- **Storage temperature and humidity** :  
-10°C to 60°C ( 14°F to 140°F ) & 0% to 70% RH.
- **Power source** : Qty 6 size AAA batteries.
- **Battery life (typical)** : 100 hours (zinc/carbon batteries).
- **Photo detector lead length** : 150 cm (approx.).
- **Photo detector dimensions** : 92Lx60Wx29H (mm)
- **Meter dimensions/weight** : 150Lx72Wx35H (mm)/320g
- **Accessories** : Carry case, instruction manual, batteries.

## 4. NAME OF PARTS AND POSITIONS



- 1. LCD display :** 4-digit dual display, each with a maximum reading of 5000, annunciators for measured values, unit functions and decimal points etc.
- 2.  Power button :** The power button turns the instrument ON or OFF.
- 3. AVG button:** Activates the point-average mode.
- 4.  Data-hold button:** Freeze or unfreeze the displayed readings.
- 5. cd button:** Enter luminous intensity mode.
- 6.  button:** Scroll to a setting mode, or increase or decrease the displayed setting value.

## 7. Lux/fc button:

- ① Illuminance scale select. (1 footcandle = 10.76 lux)
- ② Buzzer enable/disable option. Hold down “Lux/fc” button then press the power-on button to turn the buzzer sound on or off.

8. **MEM button:** Press once to store the data shown on the LCD to memory.

9. **READ button:** Press to enter the data memory read mode.

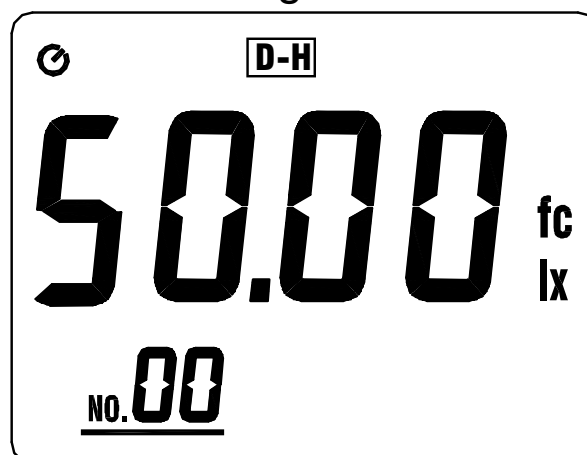
10. **Photo Detector.**

## 5. OPERATING INSTRUCTIONS

### 5-1 Illuminance Measurement

1. Press the “**ⓐ**” power button to turn the meter on.
2. Press “lux/fc” button to select the desired units; lux or fc.
3. Remove the photo detector cap and place the detector so the light falls squarely on the detector filter.
4. Read the illuminance value from the LCD display.
5. If required, press the “**H**” button to freeze the displayed value.

Press the “**H**” button again to unfreeze the display and return to normal reading mode.



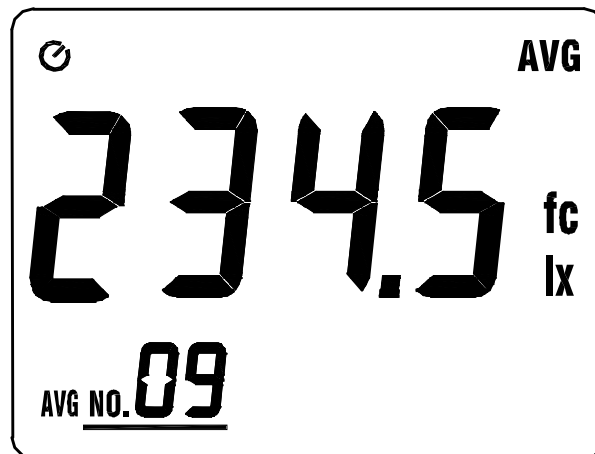
## 5-2 Point average measurement

Illuminance is a measure of the amount of light falling upon a prescribed surface area. As the RS-01 detector has only a small sensor area, the measured light level is multiplied and averaged proportionally using the point average function within the instrument to provide a corrected reading.

1. Press the “**ⓘ**” power button to turn the meter on.
2. Press the “lux/fc” button to select the desired units; lux or fc.
3. Remove the photo detector cap and place the detector so the light falls squarely on the detector filter.
4. Press the “AVG” button to enter to point illuminance average mode. The annunciator “AVG” is displayed. The maximum number of point measurements is 99.
5. Each subsequent press of the “MEM” button stores one measured point value to memory. The annunciator “AVG NO.XX” is displayed.
6. Press the “READ” button to cycle through the memory locations and perform the point average calculation. The second annunciator “AVG” is displayed with the current illuminance value reading.
7. Press the “MEM” button to add the new illuminance measured value for the average calculation.
8. Press the “▲” or “▼” button to display each of the previously measured point data.
9. Press the “AVG” button to exit this mode. All measured data stored in memory will remain, even if the instrument power is turned off. Only when new point data AVG is stored in memory No.1 will all previous measured data be cleared.

## 10. Previously measured data display procedure.

- ① Press the “**ⓘ**” power button to turn the meter on.
- ② Press the “lux/fc” button to select the desired unit; lux or fc.
- ③ Press the “AVG” button to enter point illuminance value average function.
- ④ Press the “READ” button and the previous average data is displayed.
- ⑤ Press the **▲** and **▼** buttons to select the previous point measured data as required.
- ⑥ Press the “AVG” button to exit this mode.



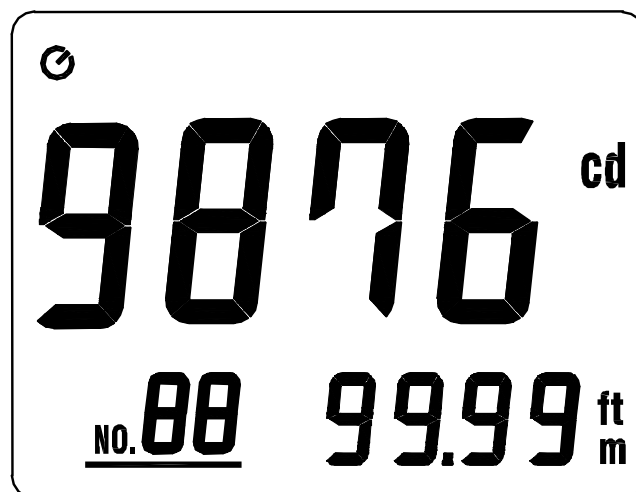
### 5-3 Luminous intensity measurement

Luminous intensity is a light source property. Defined as the quantity of luminous flux emitted uniformly into a solid angle, the basic unit of luminous intensity is the candela, equal to one lumen per steradian. To calculate luminous intensity, the detector's area and its distance from the light source must be known.

1. Press the “**ⓘ**” power button to turn the meter on.
2. Press the “lux/fc” button to select the desired units; lux or fc.



3. Remove the photo detector cap and place the detector so the light falls squarely on the detector filter.
4. Press the “cd” button to enter luminous intensity measurement mode and the annunciator “cd” is displayed, The distance annunciator “m” or “ft” is also displayed, together with the distance data previously set.
5. Press the “▲” and “▼” buttons to set the distance between the “light center of lamp” and “measurement base level”. The preset distance can be set between 0.01 to 30.47m, or 0.01 to 99.99ft. Luminous intensity measurement should only be made in a dark room, or an equivalent environment, where any light other than that from the source being measured does not influence the reading. To replicate a point light source as far as possible to enable accurate measurements, the light sensor should be set at a distance from the light source which is at least 10 times the diameter of the source. i.e. if the lamp whose intensity is to be measured is 50mm diameter, the sensor should be placed at least 500mm from the centre of the lamp.
6. Press the “cd” or “lux/fc” button to exit this mode.



## 5-4 Manual data memory and read mode :

### 1. Clear the manually memorized data

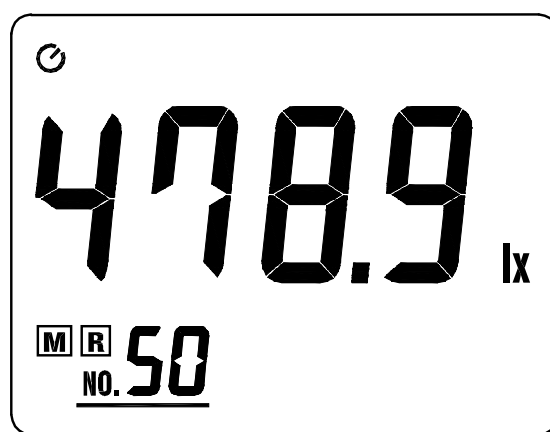
- ① Press the "ⓘ" button to turn the meter off.
- ② Press and hold down the "MEM" button, then press the "ⓘ" button to turn the meter on. When the LCD shows "CLr", the memorized data has been erased.

### 2. Manual data memory

Each press of the "MEM" button will store one set of readings to memory. The LCD will briefly show the "M" mark and the memory address number. The total number of memory locations available is 99.

### 3. Manual memory data READ



- ① Press the "READ" button to enter the READ mode. The LCD will show the "R" mark and the memory address number.
- ② Press the "▲" or "▼" button to select the desired memory address number data for display.
- ③ Press the "READ" button to exit this mode.






## 5-5 Setting or disabling the auto power-off function

The meter enters sleep mode if no button is pressed within the selected time period.

### 1. Setting the auto power-off time:


- ① Press the "  " button to turn the meter off.
- ② Press and hold down the "AVG" button then press the "  " button to turn the meter on and enter auto power-off time setting mode.
- ③ Press "▲" and "▼" buttons to set the required auto power-off time (0 to 127 minutes). If 0 minutes is selected, the auto power-off function is disabled.

### 2. To disable auto power-off function for continuous operation:


- ① Press "  " button to turn the meter off.
- ② Press and hold down the " HOLD " button, then press the "  " button to turn the meter on. The auto power-off function will be disabled and the auto power-off mark "  " will not be visible.

Auto power-off is re-enabled the next time the instrument power is turned on.

## 6. BATTERY CHECK-UP & REPLACEMENT

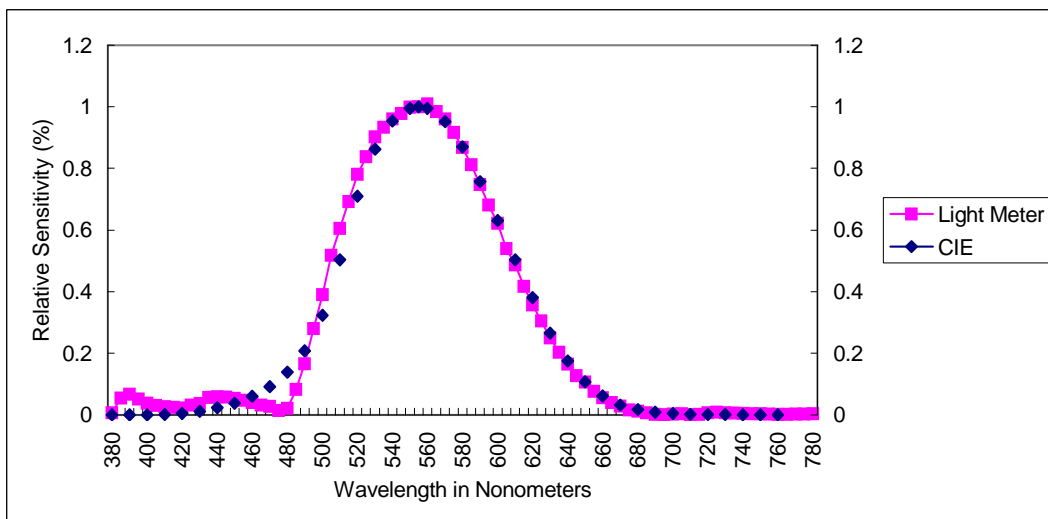
When the battery power is not sufficient to provide accurate operation of the instrument, the LCD will display "  " to indicate the batteries must be replaced.

1. Turn off the power to the meter. Release the screw holding the battery cover in place on the rear of the case.

2. Remove the all 6 exhausted cells and dispose of them in accordance with local environmental regulations. Replace the cells with qty. 6 new 1.5V AAA size cells, observing the correct polarity as shown in the battery compartment.
3. Refit the battery cover and tighten the screw.
4. Turn the instrument on and check the "  " is no longer visible in the display and the instrument operates correctly.

## 7. SPECTRAL SENSITIVITY CHARACTERISTICS

- The detector used in this instrument together with the incorporated filters, has a spectral sensitivity characteristic very close to the C.I.E. (INTERNATIONAL COMMISSION ON ILLUMINATION) photopic curve  $V(\lambda)$ , as shown in the following chart.



## 8. MAINTENANCE

1. The white plastic disc on the top of the detector should be cleaned with a damp cloth when necessary.
2. Do not store the instrument where temperature or humidity is excessively high.
3. The reference level, as marked on the faceplate, is the tip of the photo detector globe.
4. 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 and the operational time. The calibration accuracy may be enhanced by refitting the sensor cover cap when the instrument is not in use. In order to maintain the basic accuracy of the instrument, periodic calibration is recommended.

## 9. RECOMMENDED ILLUMINATION LEVELS

(1fc = 10.76 lux)

### LOCATIONS

#### ● OFFICE

	lux	fc
Conference, Reception room.	200 ~ 750	18 ~ 70
Clerical work	700 ~ 1,500	65 ~ 140
Typing & drafting	1000 ~ 2,000	93 ~ 186

- **FACTORY**

Visual work at production line	300 ~ 750	28 ~ 70
Inspection work	750 ~ 1,500	70 ~ 140
Electronic parts assembly line	1500 ~ 3,000	140 ~ 279
Packing work, Entrance passages	150 ~ 300	14 ~ 28

- **HOTEL**

Public room, Cloakroom	100 ~ 200	9 ~ 18
Reception	200 ~ 500	18 ~ 47
Cashier	750 ~ 1000	70 ~ 93

- **STORE**

Indoors stairs & corridor	150 ~ 200	14 ~ 18
Shop window, Packing table	750 ~ 1,500	70~140
Forefront of shop window	1500 ~ 3,000	140 ~279

- **HOSPITAL**

Sickroom, Warehouse	100 ~ 200	9 ~ 18
Medical examination room	300 ~ 750	28 ~ 70
Operating room		
Emergency treatment area	750 ~ 1,500	70 ~ 140

- **SCHOOL**

Auditorium, Indoor gymnasium	100 ~ 300	9 ~ 28
Class room	200 ~ 750	18 ~ 70
Laboratory, Library, or Drafting room	500 ~ 1,500	47 ~ 140