

# Cat# 59151

## Multi-functional LED Light Meter



### USER MANUAL

Morris Products Inc

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Cat# 59151 Multi Function LED Light Meter

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## Introduction

Thank you for your purchase of the multi-functional LED light meter. This meter will, with proper use, provide years of reliable service; therefore, it is recommended that the user read carefully the user's manual before using the light meter and keep for reference.

## Limited Warranty, Rights and Responsibilities

The product is guaranteed for one year from date of purchase against defects in material or workmanship. This warranty does not extend to damage caused by fire (fusing), disposable battery (exhausted), accidents, negligence, misuse, modification, pollution and abnormal operation.

## Open-package inspection

Upon reception of the light meter, inspect it to ensure no damage during shipping.  
If the user finds obvious damage or malfunction in operation, please contact MORRIS.

### Included in Carton:

Light Meter

Instruction Manual

One 9 V alkaline cell, GL6F22A 1604A

## Safety information



### Warning

**Do not use the light meter in the environment full of dust or flammable gas and steam!**

### Safety mark description

**This manual contains basic information for Multi Function LED Light Meter safe operation and maintenance. Please read carefully the following safety information before use.**

**Table 1: Safety information**

	Important information which the user must read before using the light meter
CE	Mark of conformity

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**Table 2: Warning message**

<b>Warning</b>	It indicates that incorrect operation will lead to serious injury or even fatal accidents
<b>Notice</b>	It indicates that incorrect operation or negligence will lead to meter damage or wrong measurement results, etc.
<b>Tips</b>	Operation suggestions or prompts



### Operation considerations

**User should observe the following notices to guarantee safe operation and obtain optimum performance.**






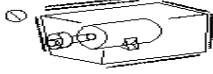
#### 1: Preliminary check

Before initial use, please check if the light meter operates normally and if it is damaged during storage and transportation. In case of any damage please contact MORRIS.

## 2: Storage & Operating Environment

Operational temperature and humidity range	-10~50°C (14~122°F) <80%RH (non-condensed)
Storage temperature and humidity range	-10~+50°C (14~122°F) <70%RH (non-condensed)

To avoid faults, please **DO NOT** place the light meter in following environments:

 <p>Direct sunlight High temperature</p>	 <p>Corrosive/ explosive gas</p>
 <p>Mist /splash High temperature/condensation</p>	 <p>Intensive electromagnetic environment</p>
 <p>Dust</p>	 <p>Mechanical vibration</p>

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## 3: Use



### Notice

- 1: The operation temperature range for the light meter is -10-50°C (14-122°F).
- 2: In order to avoid damage, especially falling accidents, handling and use should be avoided during severe mechanical vibration.
- 3: The light meter can only be calibrated and repaired by professional personnel.
- 4: Before each use, the opto-sensor of light meter should be checked for damage and dust. Make sure the meter is in good and clean condition. If one or more functions of the light meter are irregular or not ready for operation, avoid using the meter.
- 5: During the operation of the light meter, the meter measurement value should not be at OL for long time.
- 6: Keep the meter out of direct sunlight to guarantee its normal operation and long-term service life.
- 7: If the meter is subject to intensive electromagnetic field, its function will be affected.
- 8: Only use batteries specified in technical data.
- 9: Batteries should not be stored in damp or cold locations. If the low battery symbol appears on the display, the user should replace the batteries.



## Tips

- 1: The accuracy of the optical detector will be reduced due to operating conditions or time. Periodic calibration is required to maintain the basic accuracy.

# 1 Introduction

## 1.1 Outstanding features of the multi-function LED light meter

- ◆ Automatic and manual range switching
- ◆ Inquiry function for maximum and minimum values
- ◆ Data hold function
- ◆ Peak value measurement function
- ◆ Relative value measurement function
- ◆ Zero calibration function
- ◆ 3 1/2 bit LCD display, with analog bar display
- ◆ Fc/Lux unit conversion function
- ◆ Outrange indication (When the measured value exceeds the current range, LCD will display the signal “OL” to indicate that the range is not adequate)
- ◆ High precision. Measurement range (0.00~200000Lux)
- ◆ Low battery indicator
- ◆ Touch tone and mute function
- ◆ Auto power-off function  
(The machine will be powered off automatically keys are not operated for more than 10 minutes)
- ◆ Compact design, durable, and portable.

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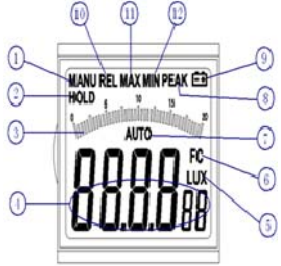
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## 1.2 Name and Function of Components

### 1.2.1 Plan view

- ① Opto-sensor protection cover
- ② Opto-sensor
- ③ LCD display screen
- ④ Compound key for main power and touch tone:  
Power on/off: Briefly press the key to activate the machine and hold button down for 1 second to shut it down. Touch tone on/off: With unit on, briefly press the key to turn on and off the touch tone.
- ⑤ max and min values inquiry key
- ⑥ Lux/Fc unit conversion key
- ⑦ Compound key for data hold and zero calibration:  
Data hold: Briefly press the key to enter/exit data hold mode.  
Zero calibration: Press & hold button for 1 second to perform zero calibration function.
- ⑧ Compound key for relative value and peak value measurement:  
Relative value measurement: Briefly press the key to enter/exit relative value measurement mode.  
Peak value measurement: Press & hold button for 1 second to enter/exit peak value measurement mode.
- ⑨ Key for manual range switching: Briefly press the key for 20.00Lux → 200.0Lux → 2000Lux → 20000Lux → 200000Lux (or 20.00Fc → 200.0Fc → 2000Fc → 20000Fc) range  
Press & hold for 1 second to exit manual range switching mode.

## LCD Display interface



- ① Prompt for manual range switching mode
- ② Prompt for data hold mode
- ③ The analog bar shows the current measurement value information.
- ④ The digit shows the current measurement value information.
- ⑤ Lux unit
- ⑥ FC unit
- ⑦ Prompt for auto measurement mode
- ⑧ Prompt for peak value measurement mode
- ⑨ Prompt for low battery
- ⑩ Prompt for relative value measurement mode
- 11.12 Prompt for max and min values inquiry

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## Measurement Methods

### 1.3 Notices Prior to Measurement



#### Warning

- 1: Do not use the light meter in environments full of dusts or having gas substances and flammable steam substances!**
- 2: Do not use the light meter for measurement in the place with high temperature and high humidity.**
- 3: Do not use the light meter in environments with intense infrared or ultraviolet rays!**



#### Tips

- 1: The opto-sensor of this meter is designed by simulating the sensitive curve of light obtained through human eyes. The spectral coverage is between 320nm and 730nm. When it is used for measurement within the infrared range, there will be a large data deviation.
- 2: The opto-sensor is calibrated by common electric incandescent lamp required by CIE under the color temperature of 2854°K; the provided reading number may be different for the spectrum of other lamps.
- 3: The reference level of light source test is at the top of the spherical surface illuminated.
- 4: The optical detector should be exposed to light for 2 minutes before measurement.
- 5: Shadows and other factors that might affect the optical detector should be avoided.

## 1.4 Measurement Values

### 1.4.1 Concepts of illuminance scales

One lux (lumen) indicates the illuminance on a surface of one square meter, all points of which are one meter from a uniform source of one candela.

One foot-candle (Fc) indicates the illuminance on a surface of one square foot, all points of which are one foot from a uniform source of one candela.

### 1.4.2 Unit conversion for illuminance scales

$$1 \text{ Fc} = 10.764 \text{ lux} \quad 1 \text{ lux} = 0.09290 \text{ Fc}$$

### 1.4.3 Conversion formula for illuminance and light intensity

$$E = I / r^2$$

Wherein E --- illumination value (Unit: Lux);

I --- Light intensity of the light source (Unit: cd);

r --- Distance from the luminous surface of light source to the optical detector (Unit: m) .

During measurement, the minimum distance between the luminous surface of light source and the opto-sensor should be more than 15 times greater than maximum size of the luminous surface (or opto-sensor).

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## 1.5 Typical practice cases

In the following practice cases, the user stands under a light source.

Remove the protection cover of the 59151 multi-functional light meter and place it at right angle to the light source, as shown in figure 2-1.

Press and hold the 59151 power key ④ for a short time to power on the light meter. The LCD screen will illuminate (about 5 seconds) with the buzzer beeping twice and “AUTO” will appear on the middle of LCD display. This indicates that the auto measurement mode is ON.

Press and hold the manual range switching key ⑨ of the 59151 for a short time, “MANU” will appear on the top left position of the LCD display, indicating that the manual range switching mode has been activated. In this mode, each time press and hold the key for a short time, the meter will switch to 20.00Lux—>200.0Lux—>2000Lux—>20000Lux—>200000Lux (or 20.00Fc—>200.0 Fc—>2000 Fc—>20000 Fc) in sequence; pressing the key for one second will result in the inscription “MANU” disappearing from top left position of LCD display, replaced by “AUTO” appearing in the middle, to indicate that the meter has switched the manual range switching mode to the auto range switchover.

Press and hold the REL/PEAK key ⑧ of the 59151 for a short time, “REL” will appear on the top left position of the LCD interface, indicating the activation of the relative value measurement mode. Press and hold the key ⑧ for a short time again, the device will exit the relative value measurement mode and return to the original measurement mode, and “REL” on the top left position of the LCD interface will disappear; pressing the key for one second will lead to the peak measurement mode, “PEAK” and “MANU” will appear on top right position of LCD display; press and hold the key for one second once again, “PEAK” will disappear from the top right position of the LCD interface, and “AUTO” will appear in the middle of LCD, and the mode will return to auto measurement mode.

Press and hold max/min value inquiry key ⑤ for a short time, “MAX” will appear on top position of LCD interface, switching the device to the max/min value inquiry mode; in this mode, each short press of the key causes the mode to change from MAX to MIN or from MIN to MAX; press and hold the “MAX/MIN” key ⑤ for one second, “MAX/MIN” on top position of the LCD interface will disappear, and the mode will exit.

Press and hold the data hold/zero calibration key ⑦ of the 59151 for a short time to enter the data hold mode, which will be indicated by the apparition of “HOLD” on the top left position of the LCD interface; press and hold the key for a short time once again, “HOLD” will disappear from the top left position of the LCD interface, and the device will exit the data hold mode. In any mode with sensor covered, press and hold data hold/zero calibration key ⑦ for one second, “ADJ” will appear on the LCD interface, and the device will enter the zero calibration mode: several seconds later “ADJ” will disappear from the LCD interface, and the device will exit the data hold mode and return to auto measurement mode.



Figure 2-1



- 1: The reference position of light source test is at the top of sphere surface under light.
- 2: In various measurement modes, analog bar in the middle of the LCD screen will change with figures.
- 3: When reading, existing data can be locked in by pressing and holding “HOLD/ZERO” key for a short time
- 4: In zero calibration modes, the opto-sensor must be covered by opto-sensor visor before calibration.
- 5: After completing the test, the sensor protection cover should be put back to protect light filter and sensor.



## 2 Specific Applications

### 2.1 Application of manual switchover of range measurement mode

- Press and hold the RAN key (range manual switchover key) for a short time, “MANU” will appear on the top left position of the LCD interface, and the meter will enter the manual switchover measurement mode (as shown in figure 3-1-1)
- When entering manual switchover of range function, press RAN key for a short time each time, it will switch to 20.00Lux→200.0Lux→2000Lux→20000Lux→200000Lux (or 20.00Fc→200.0Fc→2000 Fc→20000 Fc) in sequence
- Press and hold RAN key for one second, “MANU” on the top left position of the LCD interface will disappear, and “AUTO” will appear in middle of LCD interface, manual range switchover function will exit and the device will return to auto range switchover mode;

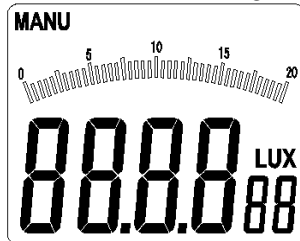
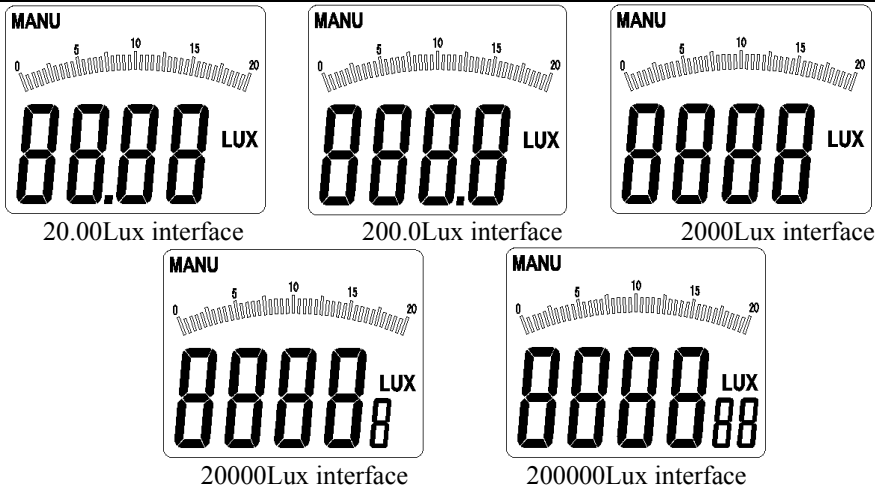


Figure 3-1-1



#### Tips

- 1: In peak value measurement mode, relative value measurement mode and max/min value inquiry mode, press RAN key for a short time.
- 2: In relative value measurement mode and max/min value inquiry mode, press and hold the key for one second, it will return to auto switchover of range.
- 3: In peak value measurement mode, data hold mode and zero calibration modes, press and hold RAN key.
- 4: In this mode, when measurement value exceeds present range, “OL” will appear on LCD interface to indicate over-range, and the user should switch over the measurement range at this time.

## 2.2 Relative/peak value measurement mode applications

- Press and hold REL/PEAK key for a short time (composite key for relative/peak value measurement), “REL” will appear on the top left of the LCD screen (as shown in figure 3-1-2A), and the device will enter the relative value measurement mode;
- Press and hold REL/PEAK key for a short time again, “REL” on the top left of the LCD screen will disappear, and the device will exit the relative value measurement mode and return to original measurement mode;
- Press and hold “REL/PEAK” key for one second, the device will enter the peak value measurement mode, “PEAK” LCD will appear on the top right of the LCD screen, and at the same time, “MENU” will appear on the top left of the LCD screen (as shown in figure 3-1-2B);
- Press and hold the key once again for one second, “PEAK” on top right position of LCD screen will disappear, and “AUTO” will appear on the middle of LCD screen, and the device will exit the peak value measurement mode and return to auto measurement mode (as shown in 3-1-2C).

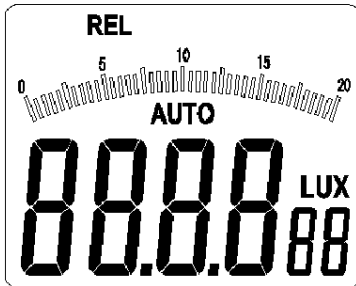


Figure 3-1-2A

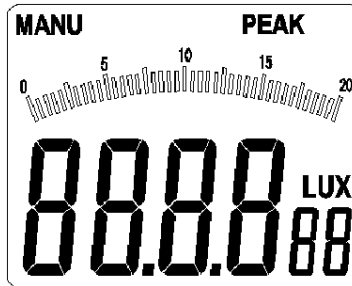


Figure 3-1-2B

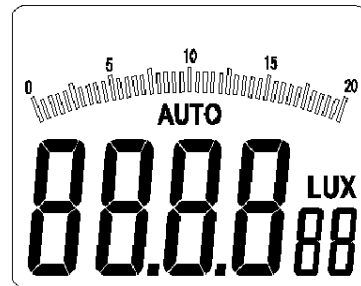


Figure 3-1-2C



### Tips

- 1: In auto measurement mode, peak value measurement mode, max/min value inquiry mode and data hold mode, press and hold REL/PEAK key for a short time.
- 2: In non-zero calibration mode, press and hold “REL/PEAK” for one second, the device will enter the peak value measurement mode.

## 2.3 Application of maximum/minimum value inquiry mode

- Press and hold “MAX/MIN” key for a short time, “MAX” will appear on top LCD interface (as shown in figure 3-1-3);
- In max/min value inquiry mode, press “MAX/MIN” key once, you will switch MAX to MIN or MIN to MAX;
- Press and hold “MAX/MIN” for one second, “MAX/MIN” on top LCD interface will disappear, and the max/min value inquiry mode will exit.

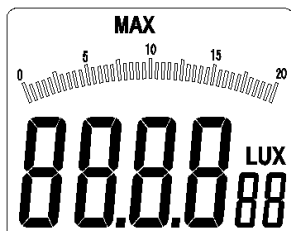


Figure 3-1-3

**Tips**

In non-zero calibration mode, press and hold “MAX/MIN” key for a short time to use the max/min value inquiry functions;

## 2.4 Application of data hold and zero calibration mode

- Press and hold “HOLD/ZERO” key for a short time, “HOLD” will appear on the top left of the LCD screen (as shown in 3-1-4A), then the device will enter the data hold mode
- Press and hold the key again, “HOLD” on the top left of the LCD screen will disappear, the meter will exit the data hold mode
- Cover the opto-sensor with the visor, and press and hold “HOLD/ZERO” key for one second, “ADJ” will appear on LCD screen (as shown in figure 3-1-4B), then the device will enter the zero calibration mode. Several seconds later, “ADJ” on LCD interface will disappear, and zero calibration mode will automatically exit and return to auto measurement mode.

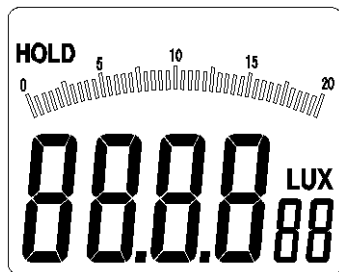


Figure 3-1-4A

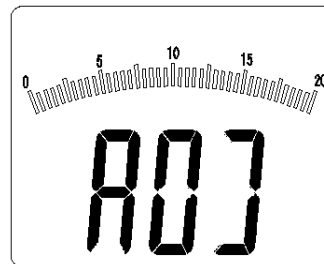


Figure 3-1-4B

**Notice**

Before zero calibration, the opto-sensor must be covered with the opto-sensor visor.

**Tips**

- 1: In non-zero calibration mode, press and hold “HOLD/ZERO” key for a short time to enter the data hold mode.
- 2: Zero-calibration can be made in any mode.

**Auto power-off**

If there is no action on keys of the Multi Functional LED Light Meter for a long time, the meter will automatically power off about 10 minutes later.

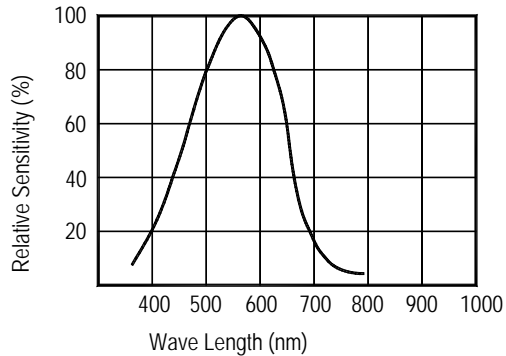
### 3 Technical Data

- ◇ Temperature range:  
 Operation: -10~50 °C, max 80 % HR (Non-Condensed)  
 Storage: -10~50 °C, max 80 % HR (Non-Condensed) (removing batteries)
- ◇ Sampling rate:  $\geq 2$  times/s.
- ◇ Display: 3½ digits, max reading of 1999, with analog bar display;
- ◇ Sensor: silicon photoelectric diode
- ◇ Measured spectral range: 320~730nm
- ◇ Measurement ranges: 20, 200, 2000, 20000, 200000 Lux  
 20, 200, 2000, 20000 FC
- ◇ Operating environment: indoor use
- ◇ Height: 2000m highest
- ◇ Battery life: Approx. 200 hours
- ◇ Power supply: 1×9 V, IEC 6LR61
- ◇ Dimensions (H×W×D): 190 mm×89 mm×42.5 mm
- ◇ Weight: Approx. 360 g without batteries  
 Approx. 420 g with batteries
- ◇ Accuracy:  $\pm 3\%$  (calibrated with incandescent lamps in 2854K)  
 $\pm 6\%$  other visible light source

Cosine angle deviation characteristics	
Cosine angle	Deviations
30°	$\pm 2\%$
60°	$\pm 6\%$

Tips: cosine angle is corrected in accordance with JIS C 1609:1993 and CNS 5119 Grade A General Specification.

Luminous sensitivity characteristics:




## 4 Maintenance and Service

### 4.1 Service



When the meter seemingly fails during operation, following steps should be followed to check the fault problem:

- 1: Check batteries. If “” appears on the LCD display, batteries should be replaced.
- 2: Refer to the operation instructions to check if operation steps are wrong.

### 4.2 Cleaning

First wipe the meter with a damp soft cloth with clean water or neutral detergent and then with a dry cloth.



- 1: Please make sure the light meter is turned off before cleaning.
- 2: Do not use benzene, alcohol, acetone, ethyl ether, ketones, thinners and gasoline, etc. for cleaning
- 3: The light meter can only be used again when it is completely dry after cleaning.

### 4.3 Battery replacement

If the battery symbol appears on the LCD accompanied by buzzer alarm, batteries must be replaced.

Batteries should be replaced as follow:

- Turn off the meter;
- Remove the screw on the back of the meter and open the battery compartment;
- Remove exhausted batteries;
- Replace new batteries check polarity;
- Replace the battery compartment cover and secure the compartment screw.



- 1: Pay attention to the polarity of the battery when putting in or replacing batteries. In case of polarity reversal, the light meter will be damaged, and may cause explosion or fire.
- 2: Never connect one pole of the battery to the other one with wire, never throw batteries into fire or it will cause explosion.
- 3: Do not attempt to destroy the battery! The battery's intensively alkaline electrolyte is corrosive and can cause injury. In case of contact of the electrolyte with skin or clothes, immediately rinse with clean water; in case of contact with eyes, immediately rinse eyes with clean water and seek medical attention.



## Notice

- 1: The light meter should be turned off before replacing batteries.
- 2: Use batteries specified in technical data only.
- 3: If the meter is not to be used for a long time, remove the batteries.
- 4: For disposal of used batteries, follow existing specifications on battery recycling, reuse and treatment.

## 4.4 Calibration Interval

In order to ensure the accuracy of the meter, periodic calibration should be performed by our debugging personnel. It is recommended to make calibration every year. If the meter is in frequent use or used in poor environments, the calibration interval should be adjusted accordingly. If the meter is less used, the calibration interval may be prolonged up to three years.

## Reference Table for Illumination Standard of Various Locations

**Fc illuminance value can be got from Lux illumination value divided by 10.6**

Schools:

Illuminance (Lux)	Locations
1500~300	Drafting classroom, sewing classroom, computer classroom
750~200	Classroom, laboratory, practice workshop, research room, reading room, stack room, office, staff lounge, conference room, health center, restaurant, kitchen, pantry, radio room, printing room, switchboard room, guard room, indoor stadium
300~150	Large classroom, auditorium, storage cabinet room, lounge, staircase
150~75	Corridor, elevator corridor, toilet, duty room, workers room, bridge, school outdoor playground
75~30	Warehouse, garage, fire escape

Office:

Illuminance (Lux)	Locations
2000~1500	Design office, clerk's office
1500~750	Hall information channel (daytime), parlor, drawing office, punching, typing
750~300	Calculator room, conference room, printing room, switchboard room, control room, reception room, recreation room, restaurant
300~150	Stack room, entertainment room, dining room, lounge, guard room, elevator (passway), washroom, toilet
150~75	Tea room, changing room, warehouse, nightwatchmen office (entrance)
75~30	Fire escape

Factories:

Illuminance (Lux)	Locations
3000~1500	Ultra-precision operation, design, drafting, precision inspection
1500~750	Design office, analysis, assemble line, coating
750~300	Packaging, measurement, surface treatment, warehouse office
300~150	Dyeing, casting, electrical room
150~75	Entrance and exit, corridor, information channel, staircase, dressing room, toilet, operation warehouse
75~30	Fire escape, warehouse, outdoor power equipment (loading and unloading, inventory move operation)

Hospital:

Illuminance (Lux)	Locations
10000~5000	Visual function test chamber (ophthalmology lightroom)
1500~750	Operating room
750~300	Consulting room, treatment room, pharmacy room, prescription room, drug store, dissection room, pathological bacteria room, emergency rooms, maternity ward, dean's office, offices, nursing room, conference room
300~150	Ward, medicine room, bed reading, medicine changing, plaster bandage for fractures, infant room, record room, waiting room, consulting room, outpatient corridor
150~75	Locker room, physical therapy room, X-ray room, ward corridor, medicine room, sterilization room, ward room, stairs, endoscopy room
75~30	Animal room, dark room (photo), fire escape

Hair salon:

Illuminance (Lux)	Locations
1500~750	Haircut, perm, hair dyeing, cosmetics
750~300	Shave, hairdressing, lobby registration counter, makeup
300~150	Toilet in salon
150~75	Corridor, stairways

Hotel, restaurant, recreation ground:

Illuminance (Lux)	Locations
1500~750	Counter
750~300	Halfway, banquet hall, business room, parking lot, kitchen
300~150	Restaurant, toilet, a large Japanese-style room
150~75	Recreation room, corridor, stairways, guest room, bathroom, accent lighting for gardens, changing room
75~30	Fire escape

Shop, department store:

Illuminance (Lux)	Locations
3000~750	Indoor display, decorative window display, demonstration area, checkout counter, packaging table
750~300	Elevator lobby, escalators
300~150	Discussion room, dressing room, toilet, stairs, walkways
150~75	Lounge, general lighting in store

House:

Illuminance (Lux)	Locations
2000~750	Handcraft, tailoring
1000~500	Writing, work
750~300	Reading, makeup, kitchen table, processing area, telephone
300~150	Wash sink, entertainment room, living room, family reunion, entrance (inside) mirror
150~70	Wardrobe, bedroom, bathroom, stairs, corridor
75~30	Doorplate, mailbox, doorbell key, terrace