LX20

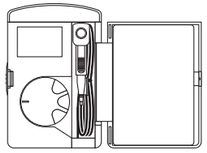
ILLUMINANCE METER

INSTRUCTION MANUAL

SANWA ELECTRIC INSTRUMENT CO., LTD.
Dempa Bldg, Sotokanda 2-Chome,Chiyoda-ku, Tokyo, Japan
TEL.: 81-3-3251-0941 FAX.: 81-3-3256-9740
Web site: www.sanwa-meter.co.jp
e-mail: exp_sales@sanwa-meter.co.jp

How to store the light sensor probe
The light sensor probe can be stored in the main body as shown below.

1. Fit the light sensor probe into the storage position so that the light sensor window faces up.
2. Bend the cord and store it in the space on the right of the light sensor probe.



[7] Maintenance and Administration

To maintain accuracy, perform calibration and inspection at least once a year.

1. Maintenance check

1) External finish
- Check if the external finish is damaged by dropping the instrument, etc.

2) Light sensor
- Check if the light sensor window is damaged.
- Check if the light sensor cord is damaged.

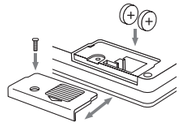
If any of the above parts is damaged, do not use the instrument but have it repaired.

2. Calibration
For calibration and inspection of the instrument, please contact dealer, sole agent and maker.

3. Battery replacement
Replacement Procedure:

1) Remove the screw retaining the battery compartment cover using a Phillips screwdriver.
2) Remove the battery compartment cover and take out the exhausted battery.

3) Insert a new battery without mistaking the + and - polarity.
4) Attach the battery compartment cover and clamp it with the screw.



The button-battery is made of oxidized silver, etc.
Please keep it away from little children lest they should swallow it in.

⚠CAUTION

Set a battery with its polarities facing in the correct directions.

Batteris when the meter is shipped:
A battery for monitoring has been installed prior to shipment from the factory. It may be discharged before the expiration of the described battery life.
*The battery for monitoring is a battery used to check the functions and performance of the product.

4. Storage
- The panel and case are little resistant to volatile solutions and heat. Do not wipe the instrument using lacquer thinner or alcohol and do not place it heat a source of high temperatures (soldering iron, for example).
- Do not store the instrument in a place subject to vibrations or in a place from it may drop.
- Do not store the instrument under direct sunlight or in a place with low temperatures, high humidity or condensation.
- Be sure to remove the battery when the instrument is not to be used for an extended period.

[8] AFTER-SALE SERVICE

1. Warranty and Provision
Sanwa offers comprehensive warranty services to its end-users and to its product resellers. Under Sanwa's general warranty policy, each instrument is warranted to be free from defects in workmanship or material under normal use for the period of one (1) year from the date of purchase.
This warranty policy is valid within the country of purchase only, and applied only

to the product purchased from Sanwa authorized agent or distributor.
Sanwa reserves the right to inspect all warranty claims to determine the extent to which the warranty policy shall apply. This warranty shall not apply to disposables batteries, or any product or parts, which have been subject to one of the following cases:
1.A failure due to improper handling or use that deviates from the instruction manual.
2.A failure due to inadequate repair or modification by people other than Sanwa service personnel.
3.A failure due to causes not attributable to this product such as fire, flood and other natural disaster.
4.Non-operation due to a discharged battery.
5.A failure or damage due to transportation, relocation or dropping after the purchase.

2. Repair
Customers are asked to provide the following information when requesting services:
1.Customer name, address, and contact information
2.Description of problem
3.Description of product configuration
4.Model Number
5.Product Serial Number
6.Proof of Date-of-Purchase
7.Where you purchased the product
Please contact Sanwa authorized agent / distributor / service provider, listed in our wbsite, in your country with above information.An instrument sent to Sanwa / agent / distributor without those information will be returned to the customer.
Note:
1)Prior to requesting repair,please check the following:
Capacity of the built-in battery, polarity of installation.
2)Repair during the warranty period:
The failed meter will be repaired in accordance with the conditions stipulated in 1.Warranty and Provision.
3)Repair after the warranty period has expired:
In some cases, repair and transportation cost may become higher than the price of the product. Please contact Sanwa authorized agent / service provider in advance.
The minimum retention period of service functional parts is 6 years after the discontinuation of manufacture. This retention period is the repair warranty period. Please note, however, if such functional parts become unavailable for reasons of discontinuation of manufacture, etc., the retention period may become shorter accordingly.

4)Precautions when sending the product to be repaired:
To ensure the safety of the product during transportation, place the product in a box that is larger than the product 5 times or more in volume and fill cushion materials fully and then clearly mark "Repair Product Enclosed" on the box surface. The cost of sending and returning the product shall be borne by the customer.

3. SANWA web site
http://www.sanwa-meter.co.jp E-mail: exp_sales@sanwa-meter.co.jp

[9] Specifications

Light sensor element	Si photodiode with approximated relative luminous efficiency
Display	Digital display: 4039 full scale
	Bar graph display: 41-segment display
"Over" display	displays"OL"
Battery warning display	Blinking "BT" appears in the display when the built-in battery is nearly exhausted and battery supply voltage drops
Sampling rate	Digital display: Approx. 2 times/sec
	Bar graph display: Approx. 20 times/sec
Measuring ranges	400 lx range: 0.1 lx to 403.9 lx
	4000 lx range: 1 lx to 4039 lx
	40 klx range: 0.01 klx to 40.39 klx
	400 klx range: 0.1 klx to 403.9 klx
Measuring accuracy	±(5 % of reading + 1 digit) at 3000 lx or less, ±(7.5 % of reading + 1 digit) at 3000 lx or more. (Equivalent to JIS General Class A for products for use other than certification and trading) Temperature: 23 °C±2 °C
Temperature drift	±5 % at 23 °C within operating temperature range
Relative spectral sensitivity	Approximating the standard luminous efficiency
Functions	Data Hold function
	Auto power save function (15 min. after operation)
EMC directive, RoHS directive	IEC61326(EMC). EN50581(RoHS).
Power supply	LR44 1.5 V x 2
Power consumption	Approx. 13 mW
Environmental condition	Altitude 2000 m or below, pollution degree II.
Operating temperature/humidity range	Temperature 0 to 40 °C, Humidity 80 %RH or less (without condensation)
Storage temperature/humidity range	Temperature -10 to +50 °C, Humidity 80 %RH or less (without condensation)
Main body dimensions & mass	117(*H*) x 76(*W*) x 18(*D*) mm, approx. 120 grams
Light sensor probe	84(*H*) x 16(*W*) x 10(*D*) mm
Sensor cord length	Approx. 0.9 m
Provided accessories	Instruction manual x 1

Design and specifications are subject to change for reasons of improvement, etc.

Thank you for purchasing SANWA illuminance meter LX20.
Read this manual carefully before using the instrument for safety use. Retain this manual together with the instrument for future reference.

[1] Operating Precautions

- Be careful not to stain or damage the light sensor window. If the light sensor window gets dirty, wipe lightly with a soft, dry cloth.
- Do not move the light sensor probe cord during measurement, as this may result in variation of the displayed value. Take special care not to move the cord particularly during measuring low illuminance values.
- This instrument incorporates the auto power save function, which turns it off in 15 minutes after an operation. To turn the instrument on after it has been turned off by the auto power save function, set the Range switch to OFF and keep it in the OFF position for more than 1 second before setting it to another position.
- Be sure to set the Power/Range switch to OFF after use.

[2] Applications

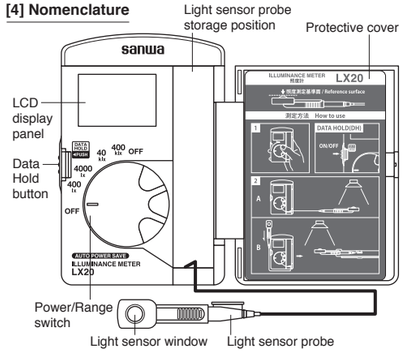
This instrument is a pocket-sized illuminance meter featuring excellent portability and operability.
It can be applied easily to a wide range of purposes from brightness checking in daily life to illumination maintenance in offices and factories as well as illumination management in agriculture and forestry.

[3] Features

- Easy-to-carry pocket size.
- Separate, stick-shaped light sensor (window diameter 9 mm) from the main body enables measurement of a narrow position or area. The light sensor can also be integrated with the main body for measurement.
- 4039 full-scale count with a bar graph display.

- Improved measurement accuracy by using a silicon photodiode, which has a spectral sensitivity approximating the relative luminous efficiency specified by CIE (Commission Internationale d'Eclairage), in the light sensor.
- Wide measuring range of 0.1 lx to 403.9 klx (403,900 lx).
- Data hold function.
- Auto power save function prevents wasting of battery power.

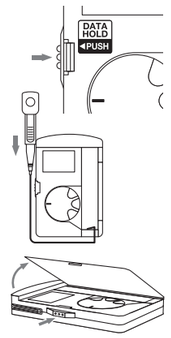
[4] Nomenclature



[5] Functions

- Power/Range switch
This rotary switch is used to turn the illuminance meter on-off and switch the measurement range to the 400 lx, 4000 lx, 40 klx or 400 klx range.

- Battery warning indicator
When the internal battery is nearly exhausted and the supply voltage drops, blinking "BT" appears in the display. If this happens, please replace the battery with new one.
- Data Hold button (Also used as the protection cover lock)
Push this button during measurement to hold the digital current value and bar graph display. "DH" appears in the display while the display data is held. Pushing this button again releases the data hold function and causes "DH" to disappear from the display.



How to integrate the light sensor probe with the main body for measurement
Insert the light sensor probe in the position on the top left of the main body as shown in the figure on the right.

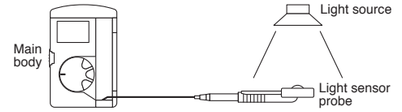
How to open or close the protective cover

1. To open the protective cover, push and hold the button on the left side of main body into the direction shown in the figure, and open the protective cover.
2. To close the protective cover, first store the light sensor probe in the storage position of the main body and then close the protective cover until it is locked.

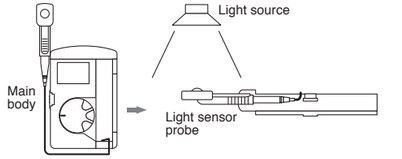
[6] Measurement

Measurement Procedure

1. Set the measuring range according to the illuminance to be measured.
2. Extend the light sensor probe cord to the point you want to measure illuminance and point the light sensor window toward the measurement target light source.

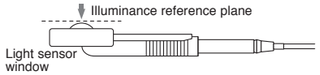


It is also possible to measure illuminance while the light sensor probe is integrated with the main body.



3. After completing measurement, set the Power/Range switch to OFF.

Notes)
- When over range, displays "OL".
The illuminance reference plane is located at the
- top of the sensor as shown below illustration.



Notes) The auto power save function of the instrument turns it off in 15 minutes after an operation. To turn the instrument on after it has been turned off by the auto power save function, set the Range switch to OFF and keep it in the OFF position for more than 1 second before setting it to another position.

Reference: Illuminance Standard in JIS Z 9110

Illuminance / Type	1500	700	300	150	70	30	15 lx
Housing	* Sewing (dark materials)	* Study, * reading (long hours or small letters), sewing	* Reading, *Makeup, * Dining	Living room, children rooms, drawing room, dining room, kitchen	Entrance, staircases, corridors, emergency staircases, garage		
Schools	* Precision drafting, * sewing machine, * precision experiments	Drafting room, * blackboard surface, * library reading room, * sewing, * precision handicraft	General classrooms, special classrooms, library reading room, gymnasium	Auditorium, meeting rooms, corridors, staircases	Emergency staircases		
Offices	* Designing, * drafting, * typing, * calculation, * key punching	Office, drafting room, telephone exchange room, power distribution panel, instrument meter panel	Director rooms, conference rooms, reception rooms, entrance, elevators	Workshops, locker rooms, staircases, warehouses	Emergency staircases		
Roads and parks				Expressway tunnels (The illuminance of the tunnel entrances should be higher than this level.)	70 - 15: Tunnels	15 - 3: High-traffic roads	1.5 - 0.3: Low-traffic roads, roads, parks and open spaces in residential areas
Hospitals	Operating table: 10,000 or more	* Biopsy, * emergency treatment, * medicine preparation	Operating room, emergency treatment room, visual examination, medicine preparation, * technical lab, * injection	Consultation rooms, examination rooms, dispensary, waiting rooms, medical offices	Pre-consultation rooms, general hospital rooms, X-ray rooms, medicine warehouse		
Theaters			* Ticket counter, entrances, staircases	Projection booth, corridors, staircases	Audience rooms (during intermission), emergency staircases, garden		3 - 1.5 Audience rooms (during shows)
Hotels		Accounting office	Reception desk, restaurants	Guestrooms, entertainment room, corridors, lobby			
Restaurants		* Sample cases	* Cash register, cooking room, * tables	Guestrooms, waiting rooms and passages			
Beauty parlors and barbers		* Hairdressing, * hair setting, * makeup	* Haircutting, * dressing	General lighting			
Shops	* Highlighting in show windows, * Spotlighting in showcases	* Highlighting in store shelves, * Show windows, general showcases	General exhibitions, general lighting				
Department stores	* Show windows, ground floor decorations, * Important showcases	General exhibition, general showcases	Exhibitions with ambience				

*: The specified illuminance can be obtained by combining local illuminations. In this case, it is still desirable that the general illumination illuminance is more than 1/10 of the illuminance achieved using the local illumination.