

ILLUMINANCE METER

TL-1



KONICA MINOLTA

The Illuminance Meter TL-1 can be used to measure illuminance in a variety of applications. Compact, lightweight, and extremely easy to operate, the TL-1 can be used for general applications, including measuring lighting levels in the home, office, restaurant, school, etc., as well as in more specialized fields. Measurements of illuminance are shown in an easy-to-read LCD panel in units of lux or foot-candles, depending on the TL-1 model. Illuminance levels from 0.1 to 19,990 lux or from 0.01 to 1,999 foot-candles can be easily measured. Within the wide overall measuring range are three smaller ranges, one of which is automatically selected to provide the highest possible resolution for the measured illuminance level.

Before using the Minolta TL-1 Illuminance Meter for the first time, please take a moment to study this manual, and keep it handy for future reference.

STATEMENT OF FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Change or modifications not approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
Reorient or relocate the receiving antenna.

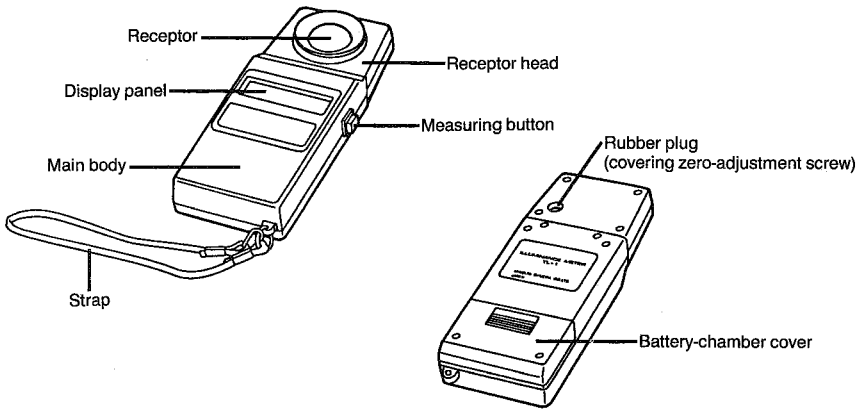
Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

STATEMENT OF DOC COMPLIANCE

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

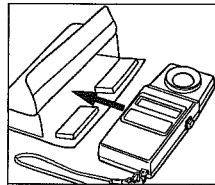
NAMES OF PARTS



- Measurement plane: Top of cosine-correction dome covering receptor

INSERTING THE METER IN THE CASE

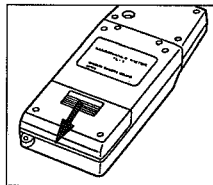
When inserting the meter in the case, be sure that the measuring button faces the case flap as shown. If the meter is inserted with the measuring button toward the inside of the case, the measuring button may be pressed accidentally, draining the battery power.



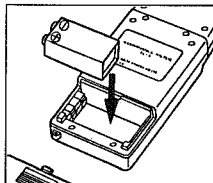
INSERTING THE BATTERY

The TL-1 is powered by a single 9V battery. To insert the battery, follow the steps below.

1. Press down on the ridged portion of the battery-chamber cover and slide it in the direction of the arrow to remove it.



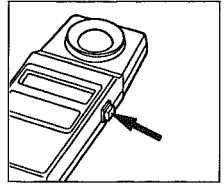
2. Position the battery terminals as shown inside the battery chamber and insert the battery into the battery chamber.



3. Realign the battery-chamber cover and slide it closed.

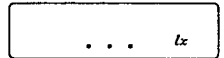
Battery Check

Press the measuring button and hold it pressed in for at least two seconds.

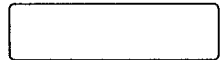


If any display other than “...” appears in the display panel, battery power is sufficient.

If “...” appears in the display, battery power is insufficient and the battery should be replaced with a new one.

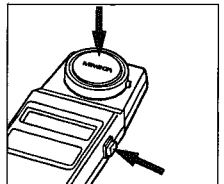


If nothing is shown in the display, check that the battery has been inserted correctly. If the battery is inserted correctly and nothing is shown in the display, the battery is completely exhausted and should be replaced with a new one.



ZERO CALIBRATION

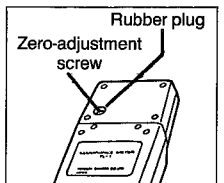
1. Cover the receptor with the included receptor cap.



2. Press the measuring button and hold it pressed in for at least two seconds. “00.0” will be shown in the display if the meter is properly calibrated.

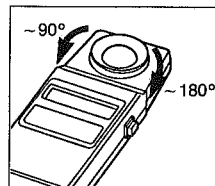
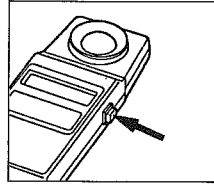


If a value other than “00.0” is shown in the display, the calibration should be adjusted. To adjust the calibration, remove the rubber plug on the back of the receptor head and use a screwdriver to turn the zero-adjustment screw until “00.0” is shown in the display. After completing adjustment, replace the rubber plug.



TAKING MEASUREMENTS

1. After performing zero calibration, remove the receptor cap.
 2. Press the measuring button and hold it pressed until the display stabilizes. After the display stabilizes, the measuring button may be released. The displayed value will be held in the display for approximately 20 seconds after the measuring button has been released, and then the meter will be automatically switched off.
- If the measuring button is pressed while a value is held in the display, the held value will be canceled and a new measurement will be started.
 - “—” will be shown in the display while the meter automatically changes measuring ranges. If “—” is shown in the display for more than three seconds, the measured illuminance is beyond the meter’s measuring range (greater than 19,990lx or 1,999ft-c, depending on the model).
 - The receptor head can be turned up to 90° to the left or up to 180° to the right.
 - The strap can be used for measuring the distance to the light source. When the clip is clipped to the strap’s ring, the distance from the meter to the end of the strap is 15cm (approximately 6 in.) If the clip is unclipped from the strap’s ring, the distance from the meter to the clip is 30cm (approximately 12 in.)



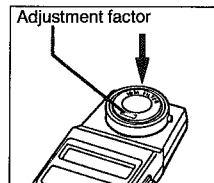
USING THE OPTIONAL ND CAP TL-A20

By using the optional ND Cap TL-A20, illuminances higher than the normal measuring range of the TL-1 can be measured.

1. Remove the receptor cap after performing zero calibration.
2. Place the ND Cap over the receptor and press it down onto the receptor until it cannot be moved down further. If the ND Cap is not fully pressed down, measurements may not be correct.

Measurements can be taken according to the procedure used for taking measurements without the ND Cap attached. To determine the measured value, multiply the displayed value by the adjustment factor printed on the ND Cap.

Measured value = Displayed value × Adjustment factor



CARE AND STORAGE

- Care should be taken to prevent the receptor from becoming scratched or dirty. To protect the receptor, be sure to cover it with the receptor cap when the meter is not in use.
- If the receptor or meter body becomes dirty, it may be cleaned with a soft, dry cloth. Do not use benzene, paint thinner, or other chemicals to clean the receptor or meter body.
- Do not press on or damage the LCD panel.
- Do not subject the meter to strong shocks or vibrations.
- Do not use the meter in areas containing large amounts of dust.
- Do not use the meter in areas with temperatures below 0°C/32°F or above 40°C/104°F.
- Do not leave the meter in areas subject to temperatures above 55°C/131°F.
- If the meter will not be used for more than two weeks, the battery should be removed to avoid the possibility of corrosion due to battery leakage.
- The meter should be stored at temperatures between –20 and 55°C/–4 and 131°F. If the meter is to be stored for a long period of time, it should be stored at room temperature. For added protection during storage, it is recommended that the meter be stored with a drying agent such as silica gel.
- Do not disassemble the meter or attempt to repair it yourself. If the meter requires repair, contact the nearest service facility.

SPECIFICATIONS

Type	Illuminance meter with digital liquid crystal display
Receptor	Silicon photocell
Spectral response	Within $\pm 4\%$ from CIE photopic standard observer curve
Cosine error	Within $\pm 3\%$ at 30° ; within $\pm 10\%$ at 60°
Display	3-1/2 digit digital liquid crystal display
Measurement range	TL-1 (lx): 0.1—19,990lx; TL-1 (ft-c): 0.01—1,999 ft-c; both units provide automatic selection of one of three smaller ranges; measurement range expandable to 1—199,900lx for TL-1 (lx) or 0.1 to 19,990 ft-c for TL-1 (ft-c) by using optional ND Cap TL-A20
Accuracy	Within $\pm 5\%$ of reading ± 1 digit
Temperature drift	Within $\pm 3\%$ (at temperatures between 0 and $40^\circ\text{C}/32$ and 104°F based on illuminance measured at $23^\circ\text{C}/73^\circ\text{F}$)
Operating conditions	0 to $40^\circ\text{C}/32$ to 104°F at less than 85% humidity with no condensation
Storage conditions	-20 to $55^\circ\text{C}/-4$ to 131°F with no condensation
Power source	One 9V battery
Dimensions	$68 \times 166 \times 32\text{mm}$ ($2-11/16 \times 6-1/2 \times 1-1/4$ in.)
Weight	180g (6-3/8 oz.) including battery
Standard accessories	Case TL-A12, Receptor Cap TL-A10, Strap TL-A11, 9V battery
Optional accessories	ND Cap TL-A20

Specifications subject to change without notice



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