Illuminance Meter T-10 Series

Accurate and Easy Measurement of Illuminance
Adapts To Various System Configurations
Modular Systems That Expand With Your Needs

High Accuracy

Multi-function
Display of illuminance difference (Δ)
Display of integrated illuminance (∑)

Compact and Light (200g)
Dual-Power Type
(AA-size battery, AC adapter)

Digital / Analog Output

New Illuminance Meters

Illuminance Meter T-10

Illuminance Meters
T-10M (1m cord)
T-10Ws (5m cord)
T-10WL (10m cord)

Multi-point illuminance measurement system
(2 to 30 points)
Illuminance meter  **T-10** &lt;standard receptor head&gt;  

Used for measurement of a wide range of illuminance

\[
\begin{align*}
0.01 \text{ to } 299,900 \text{ lx} \\
0.001 \text{ to } 29,990 \text{ fcd}
\end{align*}
\]

Illuminance meter  **T-10M** &lt;mini receptor head&gt;  

Used for measurement of illuminance that cannot be performed with the standard receptor head due to small spaces.  
The measuring range is the same as T-10  
\[
\begin{align*}
0.01 \text{ to } 299,900 \text{ lx} \\
0.001 \text{ to } 29,990 \text{ fcd}
\end{align*}
\]

The measuring range is the same as T-10 (ø14 mm receptor surface, 1 m cord)  

Since the mini receptor head and cord are waterproofed to allow measurement of illuminance under water, this product can be used for control of illuminance in the marine products industry (e.g. fish farming) and outdoor measurement of illuminance on rainy days.

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**Main Characteristics**  
**Relative Spectral Response and Cosine Correction Characteristics**

- **Relative Spectral Response** -

![Graph showing relative spectral response](image)

Ideally, the relative spectral responsivity of the illuminance meter should match \( V(\lambda) \) of the human eye for photopic vision.

As shown in the graph above, the relative spectral responsivity of Minolta Illuminance Meters T-10 is within 8% \( f(1) \) of the CIE spectral luminous efficiency \( V(\lambda) \).

CIE ; Commission Internationale de l’Eclairage

\( f(1) \) (CIE’s symbol) ; The degree to which the relative spectral responsivity matches \( V(\lambda) \) is characterized by the means of the error \( f(1) \).

- **Cosine Correction Characteristics** -

![Graph showing cosine correction characteristics](image)

Since the brightness at the measurement plane is proportional to the cosine of the angle at which the light is incident, the response of the receptor must also be proportional to the cosine of the incidence angle.

The graph above shows the cosine correction characteristics of Minolta Illuminance Meters T-10.

The cosine error of T-10 are shown in the table right.

<table>
<thead>
<tr>
<th>Incidence angle (deg.)</th>
<th>Cosine error (within)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°</td>
<td>±1%</td>
</tr>
<tr>
<td>30°</td>
<td>±2%</td>
</tr>
<tr>
<td>50°</td>
<td>±6%</td>
</tr>
<tr>
<td>60°</td>
<td>±7%</td>
</tr>
<tr>
<td>80°</td>
<td>±25%</td>
</tr>
</tbody>
</table>

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**WIDE RANGE OF APPLICATIONS**

- Lighting engineers and specifiers
- R&D at light products manufacturers
- Inspection of light sources at construction sites, government and educational facilities
- Maintenance of lights in factories, offices, and hospitals
- Electrical product manufacturers
- Quality control of light sources at home
- Agricultural and forestry industries.
**Main Features**

- **Provides multi functions and user-friendly features**
  - For basic operation
    - Normal measurement of illuminance
    - Measurement of illuminance difference
    - Measurement of integrated illuminance
  - For advanced operation
    - Setting of the reference value
    - Color Correction Factor (CCF)
      - Improves measurement accuracy of illuminance under certain light sources (e.g., inside an orange-lit tunnel).

- **Allows connection with a personal computer and continuous recording of illuminance by a recorder**
  - Digital: Use of the RS232C interface (standard accessory) output allows the meter to be connected to a personal computer.
  - Analog: Allows the meter to be connected to a recorder for output continuous recording of illuminance.

- **Quick automatic zero adjustment**
  - Turning on the meter will perform zero adjustment (no cap required), allowing immediate measurement of illuminance.

- **Auto ranging**
  - Range can also be set manually.

- **LCD back-light**
  - The LCD back-light turns on automatically when illuminance is low.

- **Uses AA-size batteries.**

- **Measures flickering light sources**

**Illuminance Measurement System to Meet Various Needs**

- **Allows simple and low-cost multi-point measurement of illuminance (2 to 30 points).**

  ![Multi-point illuminance measurement system (9 points)](image)

  ![Multi-point illuminance measurement system (5 points)](image)

  - *For projector etc.*
  - *For lighting at construction sites*

**Illuminance measurement**

- **Example of multi-point illuminance measurement (9 points)**

  ![Example of multi-point illuminance measurement (9 points)](image)

  - **Measurement type: ANSI lumen mode**
    - Current number of measuring points: 9

  - **Measurements**
    - Max: 150
    - Min: 105
    - Average: 125
    - Standard deviation: 15

  - ***grid sensor position***

- **This optional PC software offers several desirable features (e.g., easy operation, visual data display, and flexible data processing).**

  - This software provides multi-point graphical data.
  - Examples shown: grid, trend graph, and sensor position**

  - Single-point measurement and Multi-point measurement (2 to 30 points) are available.
  - Automatic measurement at user-selected intervals.
  - Tolerance setting.
  - Capability of file save, print-out and data-transfer to excel sheet.

<table>
<thead>
<tr>
<th>OS</th>
<th>Windows95/98/NT (ver4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Pentium 166 MHz or higher</td>
</tr>
<tr>
<td>Memory</td>
<td>32MB or more</td>
</tr>
<tr>
<td>Hard disk</td>
<td>20MB or more free space</td>
</tr>
<tr>
<td>Display resolution</td>
<td>800 x 600 or higher</td>
</tr>
</tbody>
</table>

* "Windows" and "Excel" are a trademark of Microsoft Corporation in the USA and other countries.

Specifications are subject to change without notice.
Illuminance meter
2 AA-size batteries / AC adapter (optional)
1mV/digit, 3V at maximum reading; Output impedance: 10K

Illuminance •••••••••••••••••••• 0.01 to 299,900 lx   0.001 to 29,990 fcd
ø3.5mm(ø1/8 in.) subminiature plug for analog output;

Within 8% (f 1 ´ ) of the CIE spectral luminous efficiency V(λ)

Receptor head ; Adapter for Multi-point ; AC Adapter ; Data processing software

69 x 174 x 35 mm (2-6/16 x 6-6/16 x 1-3/16 in.)
Silicon photocell
205g (7.2 oz.) without battery
200g (7.0 oz.) without battery
Multi-function digital illuminance meter with detachable receptor head
72 hours or longer (when alkaline batteries are used) in continuous measurement
±2% ±1digit of displayed value (based on Minolta standard)

Lux (lx) or foot candles (fcd)  (switchable)
- 20 to 55°C (-4 to 131°F) with no condensation

Within ±3% ±1digit (of value displayed at 20°C/68°F) within operating temperature/humidity range

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Illuminance meter T-10 &lt;standard receptor head&gt;</th>
<th>Illuminance meter T-10M &lt;mini receptor head&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Multi-function digital illuminance meter with detachable receptor head</td>
<td>Multi-function digital illuminance meter with detachable receptor head</td>
</tr>
<tr>
<td>Receptor</td>
<td>Silicon photocell</td>
<td>Silicon photocell</td>
</tr>
<tr>
<td>Relative Spectral Response</td>
<td>Within 8% (f 1 ´ ) of the CIE spectral luminous efficiency V(λ)</td>
<td>Within 8% (f 1 ´ ) of the CIE spectral luminous efficiency V(λ)</td>
</tr>
<tr>
<td>Cosine Correction Characteristics</td>
<td>Within ±1% at 10° ; Within ±2% at 30° ; Within ±6% at 50° ; Within ±7% at 60° ; Within ±25% at 80°</td>
<td>Within ±1% at 10° ; Within ±2% at 30° ; Within ±6% at 50° ; Within ±7% at 60° ; Within ±25% at 80°</td>
</tr>
<tr>
<td>Illuminance units</td>
<td>Lux (lx) or foot candles (fcd) (switchable)</td>
<td>Lux (lx) or foot candles (fcd) (switchable)</td>
</tr>
<tr>
<td>Measuring range</td>
<td>Auto range (manual 5 range at the time of analog output)</td>
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</tr>
<tr>
<td>Measuring function</td>
<td>Illuminance(lx), illuminance difference(lx), integrated illuminance(lx-h), integration time(h), average illuminance(lx)</td>
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</tr>
<tr>
<td>Measuring range</td>
<td>Integrated illuminance ---- 0.01 to 999,900 lx 0.001 to 29,990 fcd</td>
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</tr>
<tr>
<td>User calibration function</td>
<td>CCF (Color Correction Factor) setting function</td>
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</tr>
<tr>
<td>Accuracy</td>
<td>±2% ±1digit of displayed value (based on Minolta standard)</td>
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</tr>
<tr>
<td>Temperature/humidity drift</td>
<td>Within ±3% ±1digit (of value displayed at 20°C/68°F) within operating temperature/humidity range</td>
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</tr>
<tr>
<td>Digital output</td>
<td>RS-232C</td>
<td>RS-232C</td>
</tr>
<tr>
<td>Analog output</td>
<td>1mV/digit, 3V at maximum reading; Output impedance: 10KΩ; 90% response time: FAST setting: 1ms, SLOW setting: 1s</td>
<td>1mV/digit, 3V at maximum reading; Output impedance: 10KΩ; 90% response time: FAST setting: 1ms, SLOW setting: 1s</td>
</tr>
<tr>
<td>Display</td>
<td>3 or 4 Significant-digit LCD with back-light illumination</td>
<td>3 or 4 Significant-digit LCD with back-light illumination</td>
</tr>
<tr>
<td>Operating environment conditions</td>
<td>–10 to 40°C (14 to 104°F); relative humidity 85% or less (at 35°C/95°F) with no condensation, Maximum altitude: 2000m, Installation category; II , Pollution degree; 2</td>
<td>–10 to 40°C (14 to 104°F); relative humidity 85% or less (at 35°C/95°F) with no condensation, Maximum altitude: 2000m, Installation category; II , Pollution degree; 2</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>–20 to 55°C (-4 to 131°F) with no condensation</td>
<td>–20 to 55°C (-4 to 131°F) with no condensation</td>
</tr>
<tr>
<td>Power source</td>
<td>2 AA-size batteries / AC adapter (optional)</td>
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</tr>
<tr>
<td>Battery life</td>
<td>72 hours or longer (when alkaline batteries are used) in continuous measurement</td>
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<tr>
<td>Dimensions</td>
<td>69 x 174 x 35 mm (2-6/16 x 6-6/16 x 1-3/16 in.)</td>
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</tr>
<tr>
<td>Main body</td>
<td>69 x 161.5 x 30 mm (2-6/16 x 6-6/16 x 1-3/16 in.)</td>
<td>69 x 161.5 x 30 mm (2-6/16 x 6-6/16 x 1-3/16 in.)</td>
</tr>
<tr>
<td>Receptor</td>
<td>ø16.5 x ø12.5</td>
<td>ø16.5 x ø12.5</td>
</tr>
<tr>
<td>Cord length</td>
<td>1m</td>
<td>1m</td>
</tr>
<tr>
<td>Weight</td>
<td>200g (7.0 oz.) without battery</td>
<td>205g (7.2 oz.) without battery</td>
</tr>
<tr>
<td>Standard accessories</td>
<td>ø3.5mmø1/8 in.) subminiature plug for analog output ; Receptor cap ; Neck strap ; Case ; Battery</td>
<td>ø3.5mmø1/8 in.) subminiature plug for analog output ; Receptor cap ; Neck strap ; Case ; Battery</td>
</tr>
<tr>
<td>Optional accessories</td>
<td>Receptor head ; Adapter for Multi-point ; AC Adapter ; Data processing software</td>
<td>Receptor head ; Adapter for Multi-point ; AC Adapter ; Data processing software</td>
</tr>
</tbody>
</table>

Specifications are subject to change without notice.

SAFETY PRECAUTIONS
To ensure correct use of the instrument, please adhere to the following.

Before using the instrument, be sure to read the instruction manual.
Always use the specified power. Use of inappropriate power may result in fire or electric shock.

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