Compatible with PWM-controlled sources

Illuminance Meter
T-10A series

Illuminance meters that conform to JIS AA Class and DIN Class B requirements. Compatible with new, next-generation light sources including PWM-controlled sources.

Can be used for simple, inexpensive multi-point measurements. Mini receptor model also available to enable illuminance measurements even in narrow spaces.
For simple but accurate illuminance measurements. Makes creating illuminance measurement systems such as multi-point measurement systems easy!

**Reliable, worry-free illuminance meters that conform to JIS AA Class and DIN Class B**

Illuminance Meters T-10A and T-10MA conform to Class AA of JIS C 1609-1: 2006 "Illuminance meters Part 1: General measuring instruments" and DIN 5032 Part 7 Class-B "Photometry; classification of illuminance meters and luminance meters" requirements to provide high-accuracy, high-reliability, worry-free measurements. Illuminance meters conforming to these standards are required for measurements of general illumination light sources, white LED lamps for illumination, etc. in a variety of industrial fields.

**Removable receptor**

The receptor and main body can be detached from each other and then connected using a LAN cable, making it easy to install as part of an inspection system.

**Multi-point illuminance measuring system**

- **5-point example: Architectural lighting, etc.**
- **9-point example: Projectors, etc.**
- **25-point example: Street lighting, etc.**

![T-10A 9-point measuring system composition]

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illuminance Meter T-10A</td>
<td>1 unit</td>
</tr>
<tr>
<td>T-10A Receptor Head</td>
<td>8 units</td>
</tr>
<tr>
<td>Adapter units for Main Body T-A20</td>
<td>1 unit</td>
</tr>
<tr>
<td>Adapter units for Receptor Head T-A21</td>
<td>9 units</td>
</tr>
<tr>
<td>AC Adapter</td>
<td>1 unit</td>
</tr>
<tr>
<td>Data Management Software T-S10w</td>
<td>1 set</td>
</tr>
</tbody>
</table>

**Main applications**

- Government testing organizations
- Research/inspection at illumination equipment makers
- Maintenance at factories, offices, hospitals, etc.
- Illuminance control of security lighting, street lighting, etc.
- As sensor for equipment measuring light-distribution characteristics, etc.

**Compatible with PWM-controlled lighting. Enables measurements of next-generation light sources.**

Conventional illuminance meters often cannot accurately measure PWM-controlled light sources, but the T-10A series of illuminance meters can be used to accurately measure even such light sources.

**Easy, inexpensive multi-point measurement (2 to 30 points).**

Illuminance distribution of a projector etc. can be easily measured with a single instrument and several receptors.

**Remote control**

The receptor and main body can be detached from each other and then connected using a LAN cable, making it easy to install as part of an inspection system.

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multi-point measurement systems easy!

Data Management Software T-S10w (Optional accessory)

Convenient, easy-to-use Excel® add-in software
Reads measurement data from T-10A series Illuminance Meters directly into Excel®. Further processing of data can then be performed easily using the various functions of Excel®.

Main specifications of Data Management Software T-S10w

<table>
<thead>
<tr>
<th>Type</th>
<th>Add-in for Excel® (Excel® is required to use the add-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating environment</td>
<td>One of the following environments with Excel®&lt;br&gt;Windows® 7 Professional 64-bit + Excel®&lt;br&gt;Windows® 7 Professional 32-bit + Excel®&lt;br&gt;Windows® 7 Home Premium 64-bit + Excel®&lt;br&gt;Windows® 7 Home Premium 32-bit + Excel®&lt;br&gt;Windows® 7 Starter 32-bit + Excel®&lt;br&gt;Windows® 7 Starter 64-bit + Excel®&lt;br&gt;Windows® 8 1 Pro 64-bit + Excel®&lt;br&gt;Windows® 8 1 Pro 32-bit + Excel®&lt;br&gt;Windows® 8 1 RT 64-bit + Excel®&lt;br&gt;Windows® 8 1 RT 32-bit + Excel®&lt;br&gt;Windows® 8 Pro 64-bit + Excel®&lt;br&gt;Windows® 8 Pro 32-bit + Excel®&lt;br&gt;Windows® 8 1 Pro 64-bit + Excel®&lt;br&gt;Windows® 8 1 Pro 32-bit + Excel®&lt;br&gt;Windows® 8 1 RT 64-bit + Excel®&lt;br&gt;Windows® 8 1 RT 32-bit + Excel®&lt;br&gt;Windows® 8 Pro 64-bit + Excel®&lt;br&gt;Windows® 8 Pro 32-bit + Excel®&lt;br&gt;Windows® 8 1 RT 64-bit + Excel®&lt;br&gt;Windows® 8 1 RT 32-bit + Excel®&lt;br&gt;OS languages: English, Japanese, Simplified Chinese, Traditional Chinese&lt;br&gt;For details on system requirements for above versions of Windows®&lt;br&gt;Compatible with Excel® 2007/2010/2013/2016 32-bit or 64-bit.&lt;br&gt;Not compatible with 64-bit versions of Excel®</td>
</tr>
<tr>
<td>Compatible instruments</td>
<td>T-10A, T-10MA, T-10WA, T-10LA, T-10, T-10M, T-10MA, T-10WSA, T-10WLA</td>
</tr>
</tbody>
</table>

Relative Spectral Responsivity

Ideally, the relative spectral responsivity of the illuminance meter should match V(λ) of the human eye for photopic vision. As shown in the graph above, the relative spectral responsivity of Konica Minolta Illuminance Meters T-10A/10MA is within 6% (f1') of the CIE spectral luminous efficacy V(λ).

**CIE : Commission Internationale de l’Eclairage**

f1' (CIE symbol) : The degree to which the relative spectral responsivity matches V(λ) is characterized by means of the error f1'.

### About PWM-controlled lighting

PWM is the abbreviation of Pulse Width Modulation, and refers to the method of controlling signal intensity by controlling the ratio between the ON period and OFF period of a pulse signal.

A pulse signal is a signal which repeatedly alternates between ON and OFF, and the percentage of ON period during a single cycle is referred to as the “duty cycle”. PWM-controlled lighting is a method for controlling the brightness of a lamp by controlling the duty cycle (lit time) of light from a pulse-emission source. As the lit time becomes longer, the light becomes brighter, and conversely, as the lit time becomes shorter the light becomes darker.

### Cosine Correction Characteristics

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. For Konica Minolta Illuminance Meters T-10A/10MA, the cosine response f2 is within 3%.

### Konica Minolta’s Illuminance Measurement Trio

Konica Minolta’s line of instruments for measuring illuminance includes not only the Illuminance Meter T-10A which can measure PWM-controlled light sources, but also the Chroma Meter CL-200A which can measure color temperature and the Illuminance Spectrophotometer CL-500A which can measure color-rendering properties.

#### Illuminance Meter T-10A

Conforms to DIN Class B and JIS AA Class. Capable of accurately measuring next-generation lamps including PWM-controlled lighting. Multiple receptors can be used for easy, low-priced, multi-point measurement, and a miniature receptor model is also available for easily measuring illuminance in narrow spaces.

#### Chroma Meter CL-200A

A de facto industry standard for color-temperature measurement. Can also perform illuminance measurements (JIS AA Class). Compact and lightweight with removable receptor connectable with extension cables. Includes simple, convenient PC software as standard accessory.

#### Illuminance Spectrophotometer CL-500A

The first illuminance spectrophotometer to conform to both JIS AA Class and DIN Class B requirements. Compact, handheld type can easily be installed in inspection equipment and is ideal for evaluating color-rendering properties. Includes simple, convenient PC software as a standard accessory.

* *Both CL-200A and CL-500A can measure PWM-controlled lighting.*

### Illuminance-modified Spectroradiometer CS-2000A

Measurements of spectral irradiance are made possible by using the illuminance adapter. This makes it ideal for illuminance evaluation of projectors and LED or EL lighting. This single instrument can be used for measuring both spectral radiance and spectral irradiance. Our top-of-the-line CS-2000A is used for measuring various types of high-definition displays, and received the 13th Advanced Display of the Year 2008 Grand Prize in the Display Testing Equipment Category.
Main Specifications of T-10A

<table>
<thead>
<tr>
<th>Model</th>
<th>Illuminance Meter T-10A</th>
<th>Illuminance Meter T-10MA</th>
<th>Illuminance Meter T-10WSA</th>
<th>Illuminance Meter T-10WLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Standard receptor</td>
<td>2) Mini receptor</td>
<td>3) Mini receptor</td>
<td>4) Mini receptor</td>
<td>5) Mini receptor</td>
</tr>
<tr>
<td>Type</td>
<td>Multi-function digital illuminance meter [Multi-point measurements of 2 to 30 points is possible]</td>
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</tr>
</tbody>
</table>
| Illuminance meter class| Conforms to requirements for Class AA of JIS C 1609-1:2006 & Illuminance meters Part 1: General measuring instruments
*1 Conforms to DIN 5032 Part 7 Class B | Conforms to requirements for special illuminance meters of JIS C 1609-1:2006 | Conforms to DIN 5032 Part 7 Class B | Conforms to requirements for special illuminance meters of JIS C 1609-1:2006 |
| Receptor              | Silicon photocell        | Silicon photocell         | Silicon photocell          | Silicon photocell          |
| Calibration           | ±2% ±1 digit of displayed value | ±2% ±1 digit of displayed value | ±2% ±1 digit of displayed value | ±2% ±1 digit of displayed value |
| Measuring range       | Auto range (5 manual ranges at the time of analog output) | Auto range (5 manual ranges at the time of analog output) | Auto range (5 manual ranges at the time of analog output) | Auto range (5 manual ranges at the time of analog output) |
| Measurement function  | Illuminance (lx), Illuminance difference (lx), Illuminance ratio (%), Integrated Illuminance (lx.h), Integration time (h), Average Illuminance (lx) | Illuminance (lx), Illuminance difference (lx), Illuminance ratio (%), Integrated Illuminance (lx.h), Integration time (h), Average Illuminance (lx) | Illuminance (lx), Illuminance difference (lx), Illuminance ratio (%), Integrated Illuminance (lx.h), Integration time (h), Average Illuminance (lx) | Illuminance (lx), Illuminance difference (lx), Illuminance ratio (%), Integrated Illuminance (lx.h), Integration time (h), Average Illuminance (lx) |
| Measuring range       | 0.01 to 299,900 lx: 0.01 to 299,900 lx | 0.01 to 299,900 lx: 0.01 to 299,900 lx | 0.01 to 299,900 lx: 0.01 to 299,900 lx | 0.01 to 299,900 lx: 0.01 to 299,900 lx |
| User communication function | CCF (Color Correction Factor) setting function: Measurement value x 0.500 to 2.000 | CCF (Color Correction Factor) setting function: Measurement value x 0.500 to 2.000 | CCF (Color Correction Factor) setting function: Measurement value x 0.500 to 2.000 | CCF (Color Correction Factor) setting function: Measurement value x 0.500 to 2.000 |
| Linearity             | 0.5% ± 1 digit of displayed value | 0.5% ± 1 digit of displayed value | 0.5% ± 1 digit of displayed value | 0.5% ± 1 digit of displayed value |
| Battery performance   | 72 hours or longer (when alkaline batteries are used) | 72 hours or longer (when alkaline batteries are used) | 72 hours or longer (when alkaline batteries are used) | 72 hours or longer (when alkaline batteries are used) |
| Temperature/humidity/ drift | Within ±3% | Within ±3% | Within ±3% | Within ±3% |
| Measurement speed     | 2 times/sec. (continuous measurement with 1 receptor head) | 2 times/sec. (continuous measurement with 1 receptor head) | 2 times/sec. (continuous measurement with 1 receptor head) | 2 times/sec. (continuous measurement with 1 receptor head) |
| Analog output         | 1 mV/digit, 3 V at maximum reading; Output impedance: 10 KΩ; 90% response time: 28 ms | 1 mV/digit, 3 V at maximum reading; Output impedance: 10 KΩ; 90% response time: 28 ms | 1 mV/digit, 3 V at maximum reading; Output impedance: 10 KΩ; 90% response time: 28 ms | 1 mV/digit, 3 V at maximum reading; Output impedance: 10 KΩ; 90% response time: 28 ms |
| Display               | 3 or 4 Significant-digit LCD with backlight illumination (Automatic illumination) | 3 or 4 Significant-digit LCD with backlight illumination (Automatic illumination) | 3 or 4 Significant-digit LCD with backlight illumination (Automatic illumination) | 3 or 4 Significant-digit LCD with backlight illumination (Automatic illumination) |
| Power                 | 2 AA-size batteries / AC adapter AC-A308 (optional; for 1 to 10 receptors) | 2 AA-size batteries / AC adapter AC-A308 (optional; for 1 to 10 receptors) | 2 AA-size batteries / AC adapter AC-A308 (optional; for 1 to 10 receptors) | 2 AA-size batteries / AC adapter AC-A308 (optional; for 1 to 10 receptors) |
| Battery performance   | 72 hours or longer (when alkaline batteries are used) | 72 hours or longer (when alkaline batteries are used) | 72 hours or longer (when alkaline batteries are used) | 72 hours or longer (when alkaline batteries are used) |
| Operation temperature | 10 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation | 10 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation | 10 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation | 10 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation |
| Storage temperature   | 5 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation | 5 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation | 5 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation | 5 to 40°C, Relative humidity 85% or less (at 35°C) with no condensation |
| Size (W x D x H)      | 89 x 174 x 35 mm | 89 x 174 x 35 mm | 89 x 174 x 35 mm | 89 x 174 x 35 mm |
| Weight (without battery) | 340 g (Receptor head only: 100 g) | 340 g (Receptor head only: 100 g) | 340 g (Receptor head only: 100 g) | 340 g (Receptor head only: 100 g) |

*1 Conforms to requirements for Class AA of JIS C 1609-1:2006 for all items except cosine response (f 2).

*2 Although measurements below 1.00 are possible, they may not be reliable due to the effects of electrical noise.

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- Some lamp control methods may make accurate measurements difficult.
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- For details, please contact your nearest Konica Minolta sales office or dealer.

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