# ILLUMINANCE METER T-10 Series

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

### Illuminance Meter T-10 <standard receptor head>

Used for measurement of a wide range of illuminance
(0.01 to 299,900 lx
0.001 to 29,990 fcd)


**T-10**

### Illuminance Meter T-10M <mini receptor head>

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** (0.01 to 299,900 lx / 0.001 to 29,990 fcd)
(ø14 mm receptor surface, 1 m cord)

### Illuminance Meter T-10Ws (5m cord) / T-10WL (10m cord)

Custom order

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.


**T-10M/T-10Ws/T-10WL**

### 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.


Under water measuring example

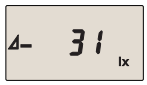
## Main Features

### Provides multi functions and user-friendly features

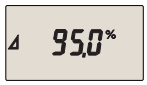
For basic operation


Normal measurement of illuminance

Measurement of illuminance difference



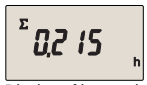

Display of illuminance difference




Display of illuminance ratio

Measurement of integrated illuminance


Display of integrated illuminance




Display of integration time


Display of average 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 output : Use of the RS232C interface (standard accessory) allows the meter to be connected to a personal computer.
Analog output : Allows the meter to be connected to a recorder for 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

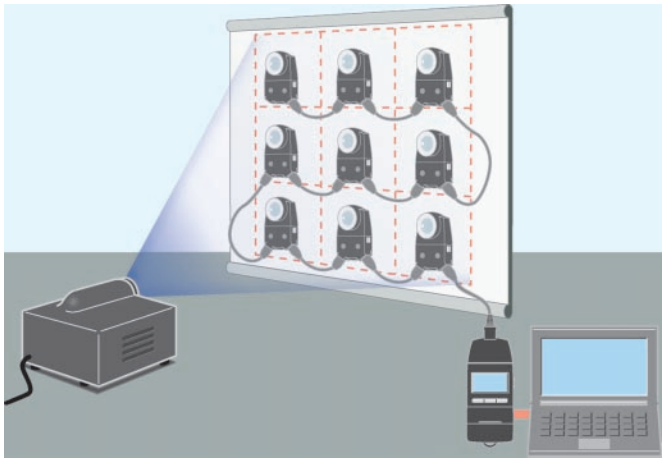
The LCD back-light turns on automatically when illuminance is low.

### Uses AA-size batteries.

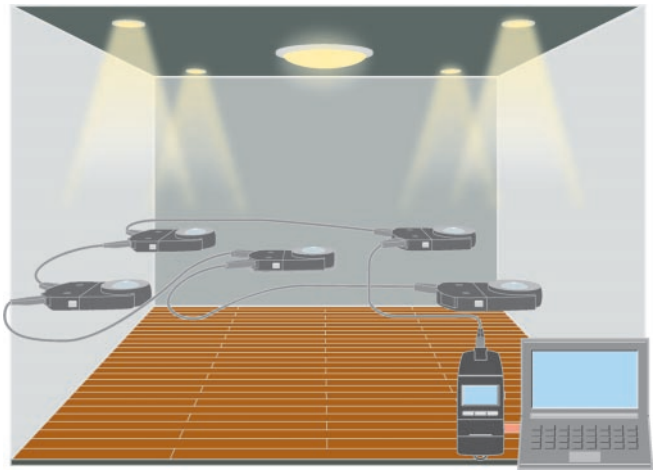
### Measures flickering light sources

## Illuminance Measurement System to Meet Various Needs

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

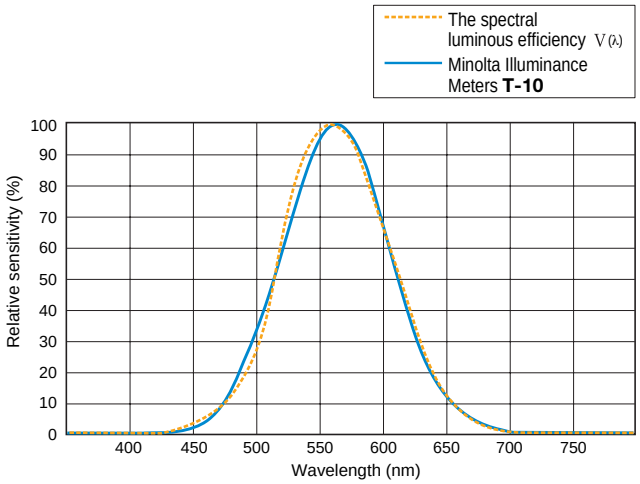


Multi-point illuminance measurement system (9 points)
For projector etc



Multi-point illuminance measurement system (5 points)
For lighting at construction sites

## Relative Spectral Response

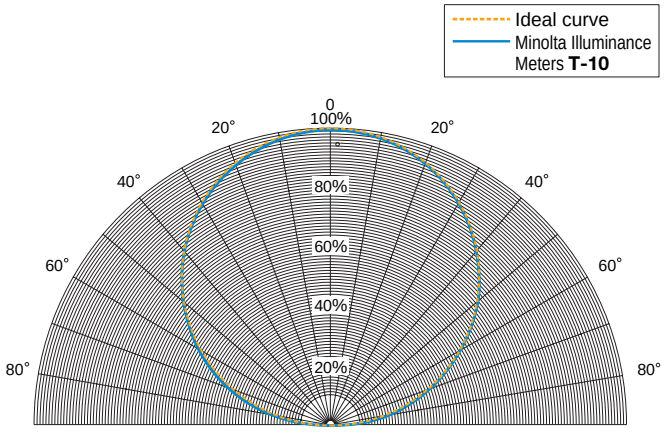



Ideally, the relative spectral responsivity of the illuminance meter should match V (λ) of the human eye for photopic vision.
As shown in the graph at left, the relative spectral responsivity of Minolta Illuminance Meters **T-10** is within 8% (f1′) of the CIE spectral luminous efficiency V (λ).

CIE ; Commission Internationale de l'Eclairage

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

## Cosine Correction Characteristics

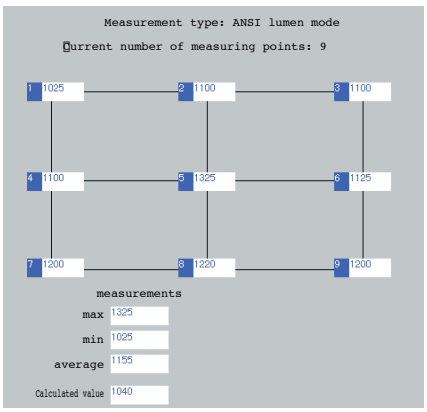



Since the brightness at the measurement plane is proportional to the cosine of the angle at which the light is incident, the response of the receptor must also be proportional to the cosine of the incidence angle.
The graph at left shows the cosine correction characteristics of Minolta Illuminance Meters **T-10**.
The cosine error of **T-10** are shown in the table right.

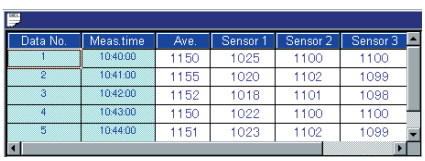
| Incidence angle (deg.) | Cosine error (within) |
|---|---|
| 10° | ± 1% |
| 30° | ± 2% |
| 50° | ± 6% |
| 60° | ± 7% |
| 80° | ± 25% |

## Illuminance measurement

Example of multi-point illuminance measurement (9 points)




****sensor position**



| Data No. | Meas.time | Ave. | Sensor 1 | Sensor 2 | Sensor 3 |
|---|---|---|---|---|---|
| 1 | 10:40:00 | 1150 | 1025 | 1100 | 1100 |
| 2 | 10:41:00 | 1155 | 1020 | 1102 | 1099 |
| 3 | 10:42:00 | 1152 | 1018 | 1101 | 1098 |
| 4 | 10:43:00 | 1150 | 1022 | 1100 | 1100 |
| 5 | 10:44:00 | 1151 | 1023 | 1102 | 1099 |

***grid**

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.******

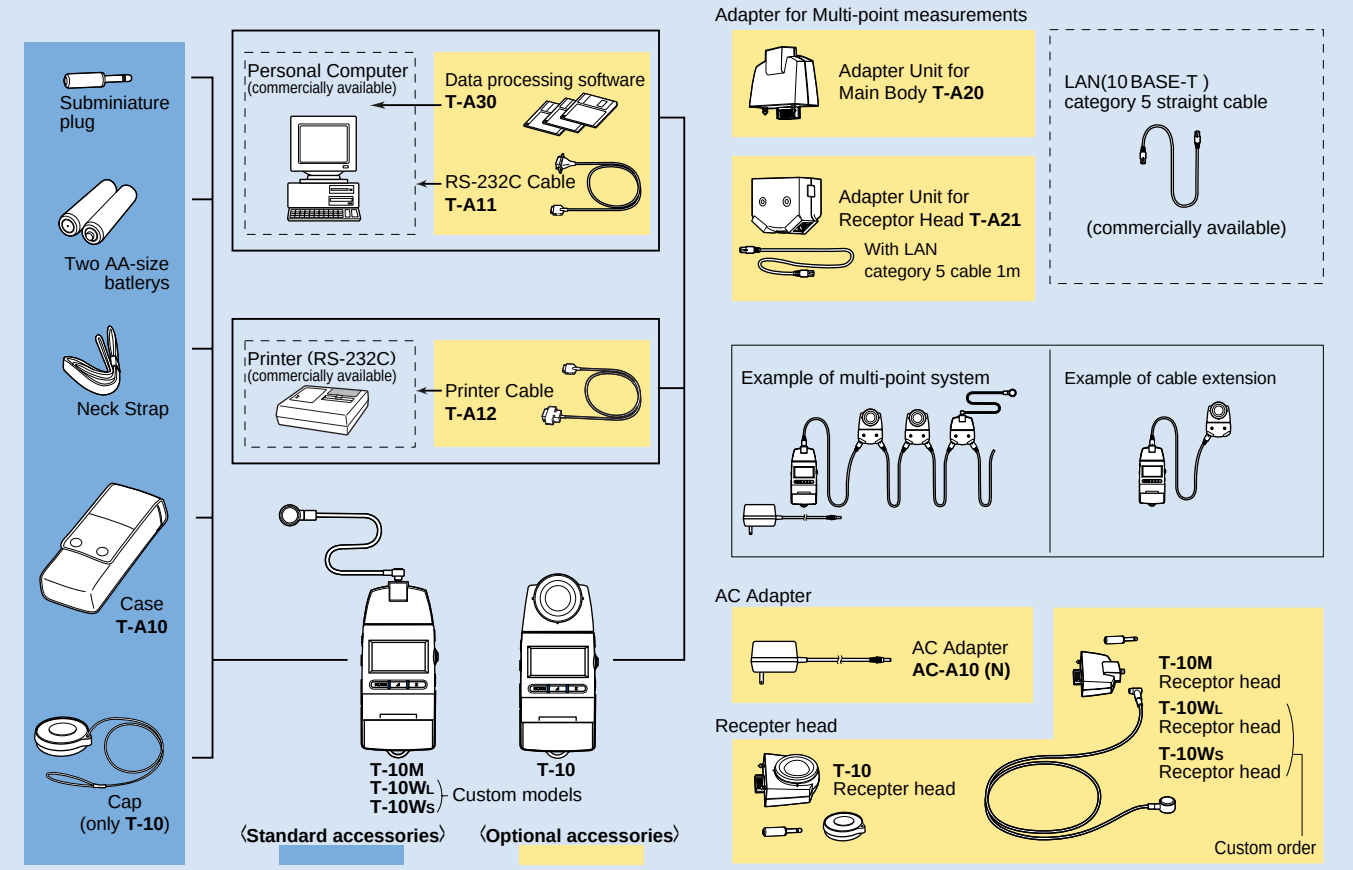
- Single-point measurement and Multi-point measurement (2 to 30 points) are available.
- Automatic measurement at user-selected intervals.
- Tolerance setting.
- Capability of file save, print-out and data-transfer to excel sheet.

| | |
|---|---|
| OS | Windows®95/98/NT (ver4) |
| CPU | Pentium 166 MHz or higher |
| Memory | 32MB or more |
| Hard disk | 20MB or more free space |
| Display resolution | 800 x 600 or higher |

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

Specifications are subject to change without notice.

## SYSTEM DIAGRAM




## SPECIFICATIONS

| | | |
|---|---|---|
| Model | Illuminance meter **T-10** <standard receptor head> | Illuminance meter**T-10M** <mini receptor head> |
| Type | Multi-function digital illuminance meter with detachable receptor head | |
| Receptor | Silicon photocell | |
| Relative Spectral Response* | Within 8% (f1´) of the CIE spectral luminous efficiency V (λ) | |
| Cosine Correction Characteristics | Within ±1% at 10° ; Within ±2% at 30° ; Within ±6% at 50° ; Within ±7% at 60° ; Within ±25% at 80° | |
| Illuminance units | Lux (lx) or foot candles (fcd) (switchable) | |
| Measuring range | Auto range (manual 5 range at the time of analog output) | |
| Measuring function | Illuminance(lx). illuminance difference(lx). illuminance ratio(%). integrated illuminance(lx•h). integration time(h). average illuminance(lx). | |
| Measuring range | Illuminance ····· 0.01 to 299,900 lx 0.001 to 29,990 fcd | |
| | Integrated illuminance····· 0.01 to 999,900 x $10^3$ lx•h 0.001 to 99,990 x $10^3$ fcd•h / 0.001 to 9999 h | |
| User calibration function | CCF(Color Correction Factor) setting function | |
| Accuracy | ±2% ±1digit of displayed value (based on Minolta standard) | |
| Temperature/humidity drift | Within ±3% ±1digit (of value displayed at 20°C/68°F ) within operating temperature/humidity range | |
| Digital output | RS-232C | |
| Analog output | 1mV/digit,3V at maximum reading; Output impedance: 10KΩ; 90% response time: FAST setting: 1ms, SLOW setting: 1s | |
| Display | 3 or 4 Significant-digit LCD with back-light illumination | |
| Operating environment conditions | −10 to 40°C (14 to 104°F); relative humidity 85% or less (at 35°C/95°F) with no condensation, Installation category;Ⅱ, Pollution degree; 2 | |
| Storage temperature range | −20 to 55°C (-4 to 131°F) with no condensation | |
| Power source | 2 AA-size batteries / AC adapter (optional) | |
| Battery life | 72 hours or longer (when alkaline batteries are used) in continuous measurement | |
| Dimensions | 69 x 174 x 35 mm (2-6/16x6-14/16x1-7/16 in.) | Main body : 69 x 161.5 x 30 mm (2-6/16x6-6/16x1-3/16 in.)<br>Receptor : ø16.5 x 12.5 (ø11/16 x 1/2 in.)<br>Cord length : 1m ( 3.3 in.) |
| Weight | 200g (7.0 oz.) without battery | 205g (7.2 oz.) without battery |
| Standard accessories | ø3.5mm(ø1/8 in.) subminiature plug for analog output ; Receptor cap ; Neck strap ; Case ; Battery | ø3.5mm(ø1/8 in.) subminiature plug for analog output ; Neck strap ; Case ; Battery |
| Optional accessories | Receptor head ; Adapter for Multi-point ; AC Adapter ; Data processing software | |

* Equivalent to 2% specified for **T-1** series.
8% CIE(f1'),new JIS(1993)
2% old JIS

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