

# 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 )  
(ø14 mm receptor surface, 1 m cord) ( 0.001 to 29,990 fcd )



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

## 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.

## 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.

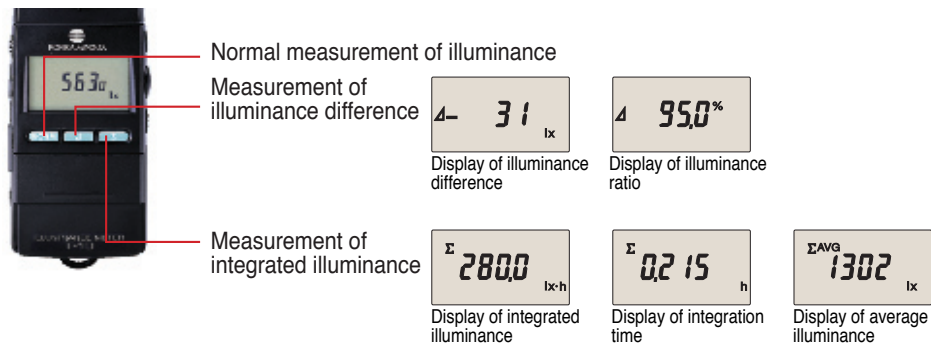


Under water measuring example

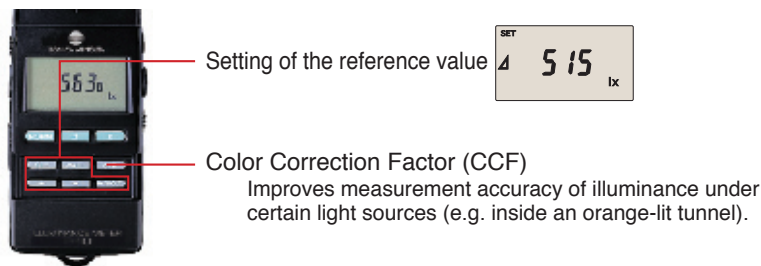
## Main Features

### Provides multi functions and user-friendly features

For basic operation



For advanced operation



### 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

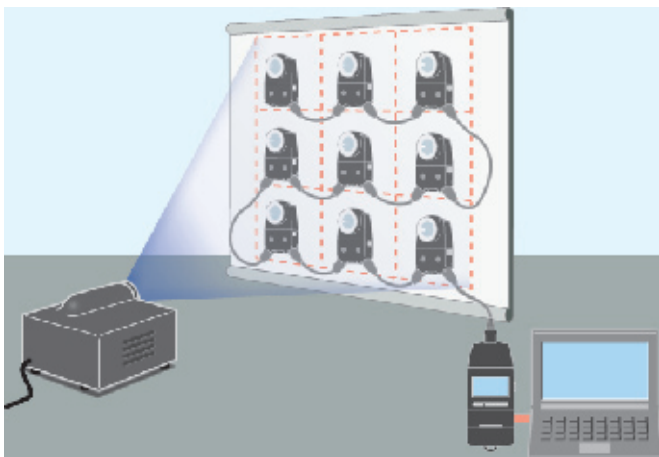
The LCD back-light turns on automatically when illuminance is low.

### Uses AA-size batteries.

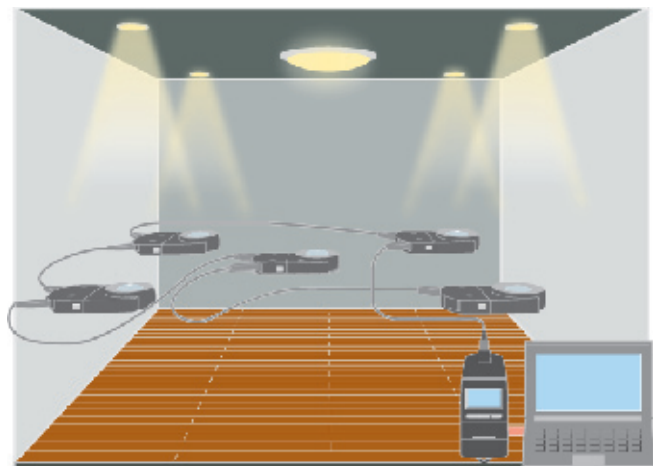
### Measures flickering light sources

## Illuminance Measurement System to Meet Various Needs

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

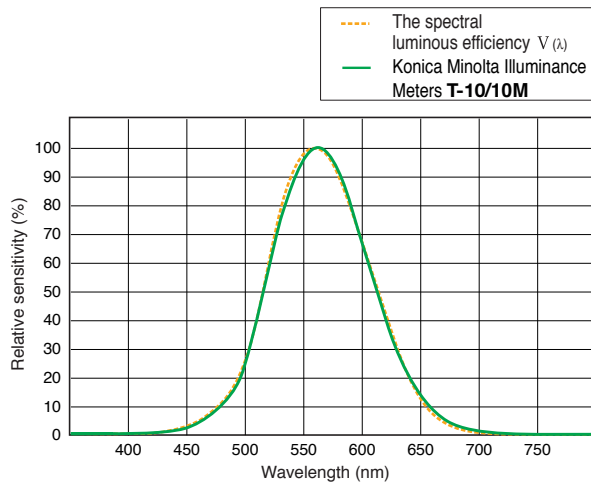


Multi-point illuminance measurement system (9 points)  
For projector etc



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

## Relative Spectral Response



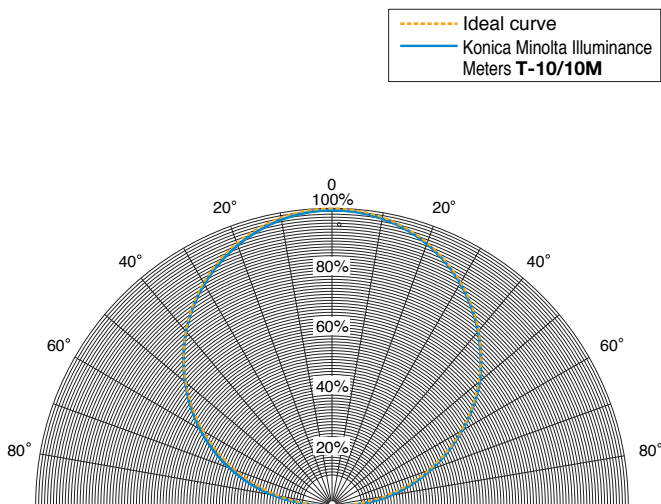
Ideally, the relative spectral responsivity of the illuminance meter should match  $V(\lambda)$  of the human eye for photopic vision.

As shown in the graph at left, the relative spectral responsivity of Konica Minolta Illuminance Meters **T-10/10M** is within 6% ( $f_1$ ) 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 means of the error  $f_1$ .

## 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-10/10M**, the cosine response  $f_2$  is within 3%.

The graph at left shows the cosine correction characteristics of Konica Minolta Illuminance Meters **T-10/10M**.

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

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

For a photometer head in an illuminance meter, the deviation in the directional response to the incident radiation is characterized by  $f_2(\epsilon, \varphi)$  :

$$f_2(\epsilon, \varphi) = \frac{Y(\epsilon, \varphi)}{Y(0, \varphi) \times \cos \epsilon} - 1$$

where

$Y(\epsilon, \varphi)$  is the signal output as a function of the angle of incidence;

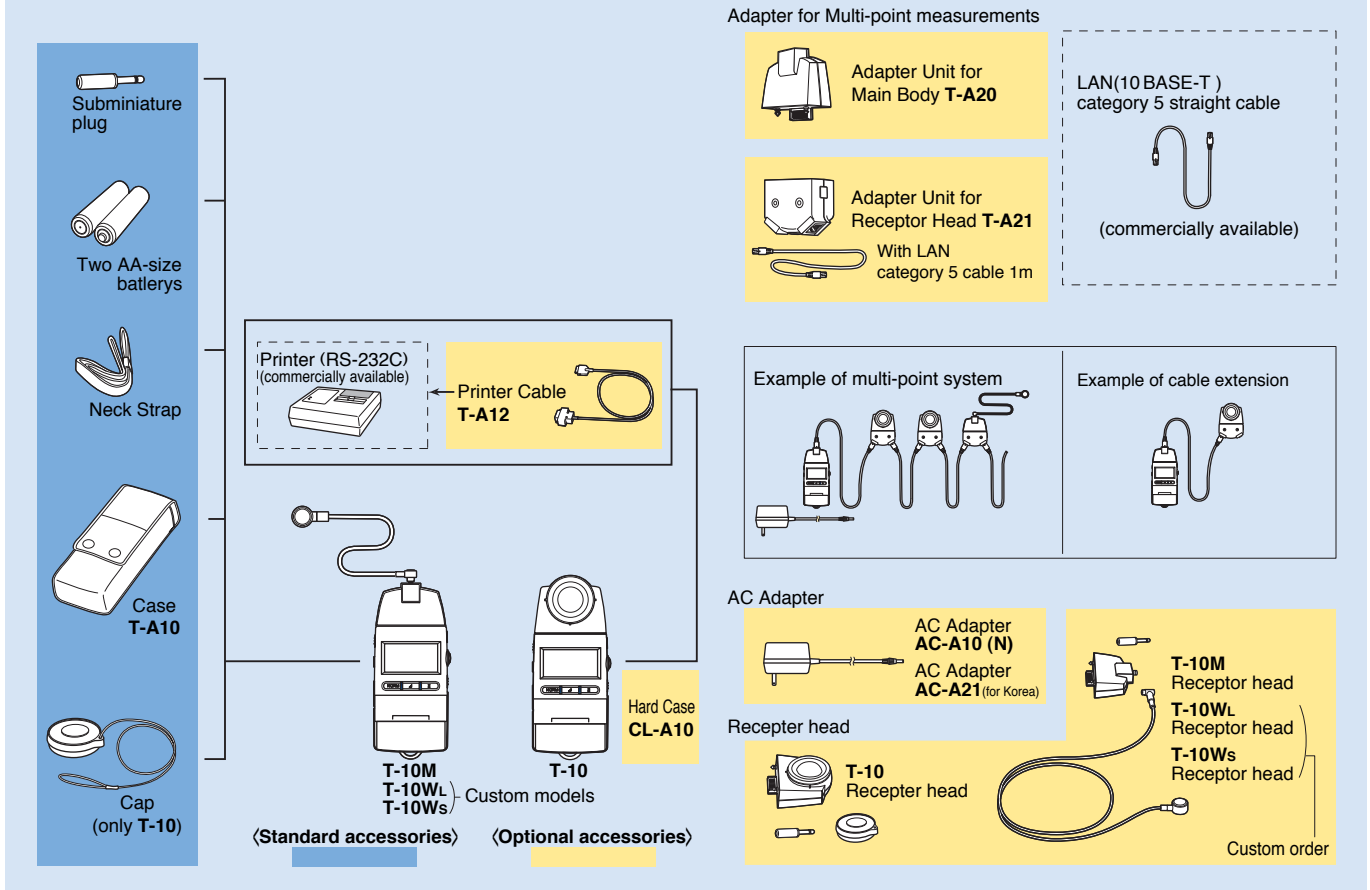
$\epsilon$  is measured with respect to the normal to the measuring plane or optical axis;

$\varphi$  is the Azimuth angle.

For characterizing the directional response error by a single factor the characteristic  $f_2$  is used:

$$f_2 = \int_0^{85^\circ - \frac{\pi}{180^\circ}} |f_2(\epsilon)| \times \sin 2\epsilon \, d\epsilon$$

## 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 6% ( $f_{1'}$ ) of the CIE spectral luminous efficiency $V(\lambda)$	
Cosine response ( $f_{\frac{1}{2}}$ )	Within 3%	
Cosine Correction Characteristics	Within $\pm 1\%$ at $10^\circ$ ; Within $\pm 2\%$ at $30^\circ$ ; Within $\pm 6\%$ at $50^\circ$ ; Within $\pm 7\%$ at $60^\circ$ ; Within $\pm 25\%$ at $80^\circ$	
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	
Linearity	$\pm 2\% \pm 1$ digit of displayed value (based on Konica Minolta standard)	
Temperature/humidity drift	Within $\pm 3\% \pm 1$ digit (of value displayed at $20^\circ\text{C}/68^\circ\text{F}$ ) within operating temperature/humidity range	
Digital output	RS-232C	
Analog output	1mV/digit, 3V at maximum reading; Output impedance: 10K $\Omega$ ; 90% response time: FAST setting: 1ms, SLOW setting: 1s	
Display	3 or 4 Significant-digit LCD with back-light illumination	
Operating temperature /humidity range	-10 to $40^\circ\text{C}$ , relative humidity 85% or less (at $35^\circ\text{C}$ ) with no condensation	
Storage temperature /humidity range	-20 to $55^\circ\text{C}$ , relative humidity 85% or less (at $35^\circ\text{C}$ ) 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.) Receptor : $\phi 16.5$ x 12.5 ( $\phi 11/16$ x 1/2 in.) Cord length : 1m (3.3 in.)
Weight	200g (7.0 oz.) without battery	205g (7.2 oz.) without battery
Standard accessories	$\phi 3.5$ mm( $\phi 1/8$ in.) subminiature plug for analog output ; Receptor cap ; Neck strap ; Case ; Battery	$\phi 3.5$ mm( $\phi 1/8$ in.) subminiature plug for analog output ; Neck strap ; Case ; Battery
Optional accessories	Receptor head ; Adapter for Multi-point ; AC Adapter	

Specifications are subject to change without notice.